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SUSTAINING ASSOCIATES

A complete list of the SUSTAINING ASSOCIATES of the Entomological Society of America will be found on the back page of the Program portion of this BULLETIN. We hope that all of our readers will note this listing.

A list was also published in the June JOURNAL OF ECONOMIC ENTOMOLOGY and the July ANNALS. Unfortunately, there were gremlins in the copy and the JOURNAL list lacked a loyal Associate. As a gesture of contriteness, we list that Associate here.

HERCULES POWDER COMPANY
Agricultural Chemicals Division
Naval Stores Department
Wilmington 99, Delaware

Two other SUSTAINING ASSOCIATES, which were not included in either the ANNALS or the JOURNAL because they were processed later, are given here.

EASTERN STATES FARMER'S EXCHANGE, INC.
26 Central Street
West Springfield, Massachusetts

NIAGARA CHEMICAL DIVISION
Food Machinery and Chemical Corporation
Middleport, New York

The first annual Memorial Lecture was delivered at the 1958, Salt Lake City meeting and the second, last year at Detroit. This Lecture is one of the highlights of our meetings and we hope the Vernon Room at the Haddon Hall will be full at 10:00 A. M., Monday, November 28. The Memorial Lecture is sponsored by one of our Sustaining Associates. This Associate has contributed a $500.00 honorarium for each lecturer. We salute this company for the contribution and we are pleased to list it here.

BIOFERM CORPORATION
Wasco, California

THE ELEMENTS OF STYLE

This note would normally appear under book reviews. We are setting it apart in the hope that some will note and a few will read—and profit. *The Elements of Style* is a short book of 71 pages by William Strunk, Jr., revised by E. B. White. It was called to our attention by ESA member Mary J. Edmands. As stated in the introduction it consists of "eight rules of usage, ten principles of composition, a few matters of form, a list of words and expressions commonly misused, a list of words commonly misspelled. That's all there is." Cloth bound, $2.50 and paper bound $1.00 from the MacMillan Company, New York.

AUTOGRAPHA O O

PROGRAM. The program for the 1960 Atlantic City meeting is printed herein. This is the fifth year that the program of our annual meeting has appeared in the September issue of the BULLETIN. Each program as printed differs from its predecessors and represents much thought, planning and hard work by the *Program Committee*, particularly the chairman. How many of us remember to commend the chairman and his committee? This is the seventy-second anniversary of the former American Association of Economic Entomologists, the fifty-fifth anniversary of the old Entomological Society of America and the eighth annual meeting since the new Society was formed. All this is merely for the record since we no longer refer to our annual meetings by number. We hope you are planning to attend and help make this a memorable occasion.

ERRATA. The June, 1960, issue of the BULLETIN contained an historical paper by T. A. Bissell. The Editor has an abiding interest in historical matter and enjoyed the Bissell paper. A typographical error somehow entered into the spelling of Townend Glover's name in the first paragraph of the article and in the References Cited. For "Townsend" in each case please read Townend. Also in the References Cited, fifth entry read patents for "patients".

POME. On occasion, we have printed selected lines of verse that sometimes scanned. Among those verses was one by emeritus member E. A. McGregor who is also the author of the following.

SOLILOQUY

In passing, let us Hail INSECTA!
Some raise pure Hell, some give us nectar;
But, without them, good and bad,
What sort of jobs might we have had?

CONGRESS. Reports we have received to date indicate that the XIth International Congress of Entomology in Vienna was a well attended and well worth while function. We believe that Society efforts in obtaining and disbursing funds which permitted 41 entomologists from the U. S. A. to attend were well worth while. The list of grant recipients will be found elsewhere in this issue. We have heard of special honors for George Anastos, C. B. Philip and C. W. Sabrosky. More complete stories on these and possibly others will be printed in a later issue.

ELECTION. No candidate received a majority of the votes cast in the recent election. In fact, the votes were closely divided among the seven candidates. Run-off ballots with the names of the three leaders have gone to the membership. By the time of the Atlantic City meeting, we shall know which of the three—F. S. Arant, Walter Carter or Robert Glen will be President-Elect in 1961 and President in 1962. W. J. Brown was elected as Section A Representative on the Governing Board and Raimon L. Beard as Section B Representative. These men, along with Ralph H. Davidson elected to the Governing Board by the North Central Branch, will take their places on the Board at the end of the Atlantic City meeting. They will replace E. G. Linsley, Morris Rockstein and J. E. Bussart.

HONORARY MEMBERSHIP. Professor Eugenia I. McDaniel was elected to Honorary Membership in this years voting. There are now 15 Honorary Members which is the constitutional limit. The other 14 who have this highest membership status are listed at the beginning of the membership list in the December, 1959, BULLETIN. These 15, we salute.

CONSTITUTIONAL AMENDMENT. The amendment to Article XII of the constitution, actually a substitution for the present Article XII, was adopted with 1,056 affirmative votes and only 55 negative in the balloting. Background on this matter will be found on pages 22 and 23 of the March 1, 1960 BULLETIN.

SIBLINGS IN OUR SOCIETY

By S. E. McGregor

Entomology Research Division, Agric. Res. Serv., U.S.D.A., Tucson, Arizona

In a recent journal, not concerned with Entomology, there was a comment about two brothers in the same field of research. This reminded me that in Entomology there are many sets of "insect brothers". In fact, the Entomology Research Division's Bee Culture Research Investigations might challenge any other unit of equal size to meet its record of such brothers.

The question arose as to why the second brother entered the same field of work. Their background was studied to see if anything in common among them might be a clue.

The Farrars

Clayton L. Farrar, leader of Bee Culture Research Investigations, Madison, Wis., and his brother, Milton D. Farrar, now dean and director of the College of Agriculture, Clemson College, Clemson, S. C., but for years associated with Entomology. They started out in Kansas. Milton was born in Lawrence October 15, 1901, and Clayton in Abilene February 22, 1904. Their interest in Entomology was aroused in a 4-H beekeeping club, which stimulated them to buy and operate 50 colonies of bees. Milton went on to Iowa State College for his B.S. and Ph.D. degrees. He got his M.S. from South Dakota State College. He spent about 21 years with the Illinois Natural History Survey and three years with the Crop Protection Institute of Durham, N. H., before moving to Clemson.

Clayton received his B.S. from Kansas State College and his Ph.D. from Massachusetts State College. After five years on the staff at that school he joined the U.S.D.A. as a bee specialist at Laramie, Wyoming. In 1938 he was transferred to Madison, Wisconsin, to head up the new bee research laboratory there, and last year he achieved his present title.

The Boharts

George E. Bohart in charge of bee culture research at the Legume Seed Research Laboratory, Logan, Utah, and his brother, Richard M. Bohart, professor in Entomology and chairman of the Department in the University of California at Davis. Both Boharts originated in Palo Alto, California, where their interest in Entomology was aroused in early boyhood days when they collected butterflies together. They maintained a mutual collection for years.

Both received their B.S., M.S., and Ph.D. degrees from the University of California; both worked as teaching assistants at the University of California at Davis; both were Entomologists for Libby, McNeil and Libby at Walla Walla, Washington; both entered the Navy as ensigns; they served together as Entomologists in various places from Washington, D. C., to Okinawa—to the great confusion of the Navy, which continually got their papers mixed up—and both left the Navy as Lieutenant Commanders. Their trails then parted, Richard, who incidentally was born September 28, 1913, going to Davis where he is still located, and George, or "Ned", who was born September 21, 1916, to Logan, Utah, his present location.

The McGregors

Samuel E. McGregor, U.S.D.A. Bee Laboratory, University of Arizona, Tucson, born January 3, 1906; and his two brothers, Ted McGregor, entomologist, Engineer Section, 4th U. S. Army, Fort Sam Houston, San Antonio, Texas, born March 9, 1910; and Walter S. McGregor, entomologist and laboratory project leader, Dow Chemical Company, Lake Jackson, Texas, born January 20, 1914.

The McGregors started out at Milano, Texas. During early boyhood S. E. developed an interest in his dad's honey bees, which in Texas A. and M. College led him to take a course in beekeeping and eventually in entomology. When Ted, and later Walter, reached college age, they also headed for Texas A. and M. With a contact in entomology they obtained part-time work in this department, which later developed into full-time employment.

The interest of S. E. remained with bees, and he served for several years as State bee inspector under the Texas Agricultural Experiment Station. Eventually he joined the Bee Culture group of the U.S.D.A. and served at laboratories in Louisiana, Arkansas, Texas, Wisconsin, and Arizona.

Both Ted and Walter were entomologists with the Texas Agricultural Experiment Station, and both were entomologists with the Sanitary Corps of the U. S. Army during World War II. Ted served some time as entomologist with the Texas Health Department before accepting his present position. Walter was previously with the U.S.D.A. Livestock Insects Laboratory at Kerrville, Texas.

The Hambletons

Lest the sibling record of Bee Culture Research Investigations be endangered, I am including its recently retired leader, James I. Hambleton, who now gives his address as Brookeville, Maryland, and his brother, Edson J. Hambleton, who is in charge of Foreign Technical Programs, and assistant to the Director of the Plant Pest Control Division of ARS, Washington, D. C.

James I. Hambleton was born January 1, 1895, in Chile, South America, and Edson in Columbus, Ohio, February 13, 1902. Their interest in Entomology was stimulated by their father, who was also an Entomologist. After James I. obtained his B.S. degree from Ohio State followed by a short period of instructing in Entomology at the University of Wisconsin, he joined the U.S.D.A. in 1921 as assistant in Beekeeping and became head of the Section in 1924.

He states, "When it was time for my brother to go to college I gave him sufficient warning that he'd never get rich as an Entomologist, but in spite of this he became a professional one." Edson got his B.S. degree from Ohio State also and his M.S. from Cornell University. He has held entomological positions in Cornell University, Brazil, Peru, and with the Office of Foreign Agricultural Relations in Washington, D. C., before his present assignment.

The Stimulus

What does this background reveal? For one thing the stimulus, in its embryonic form, originates early in the life of the youth. For recruitment to our profession, this means that we should strive to arouse interest at that age to the point of having the youth *do* something (collect, work with the bees, etc.).

Fraternal admiration seems to be a factor in leading the younger brothers into the same type of work, but fraternal association seems to be a stronger one. Entomology, it seems, like many other pleasures, needs to be shared to be most enjoyed. This is not only a fraternal compliment but also a compliment to Entomology as a profession.

If any other unit can exceed the above list of "insect brothers", Bee Culture will admit that it has been "stung". In any event, a list of other siblings is desired, so if you happen to be one or know of others, their names and addresses, sent to the author of this article, will be appreciated.

CONGRESS TRAVEL GRANTS

A short piece entitled *Travel Grants* appeared on the inside front cover of the December 1959 BULLETIN OF THE ENTOMOLOGICAL SOCIETY OF AMERICA. This announced the granting of funds to this Society by the National Science Foundation and the National Institutes of Health for the travel expenses of a limited number of U. S. entomologists to the XIth International Congress of Entomology in Vienna, August 17–25, 1960.

As reported on the inside front cover of the March 1960 issue of the BULLETIN we received 143 applications for travel grants and the funds available were sufficient for 41 entomologists. These grant recipients were selected by the *Committee on Travel Grants* after careful study of all applications.

Of the 41 initially selected, four subsequently received funds from other sources and released their grants to the Society. Alternates were selected from a list set up by the Committee. The 41 who received grants and attended the Congress are listed below.

ADKISSON, PERRY L.,
Dept. of Entomology,
Texas A & M,
College Station, Texas

ALEXANDER, RICHARD D.,
Insect Division,
Museum of Zoology,
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Ann Arbor, Michigan

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Agricultural Center,
Louisiana State University,
Baton Rouge, Louisiana

BYERS, GEORGE W.,
Department of Entomology,
University of Kansas,
Lawrence, Kansas

CHIANG, H. C.,
Department of Biology,
University of Minnesota,
Duluth, Minnesota

CLARKE, J. F. GATES,
Curator, Division of Insects,
Smithsonian Institution,
Washington 25, D. C.

COLLINS, DONALD L.,
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Albany 1, New York

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University of Notre Dame,
Notre Dame, Indiana

DEBACH, PAUL,
Department of Biological Control,
University of California,
Riverside, California

EHRLICH, PAUL R.,
Natural History Museum,
Stanford University,
Stanford, California

EISNER, THOMAS,
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Cornell University,
Ithaca, New York

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Virginia Polytechnic Institute,
Blacksburg, Virginia

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HARDY, D. ELMO,
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University of Hawaii,
Honolulu 14, Hawaii

HATCH, MELVILLE H.,
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University of Minnesota,
St. Paul 1, Minnesota

HOPLA, CLUFF E.,
Department of Zoology,
University of Oklahoma,
Norman, Oklahoma

HYLAND, KERWIN E.,
Department of Zoology,
University of Rhode Island,
Kingston, Rhode Island

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Pullman, Washington

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Whittier, California

PETERSON, ALVAH,
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Columbus 21, Ohio

PLAPP, FREDERICK W., JR.,
USDA, Entomology Research Division,
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Corvallis, Oregon

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University of Kentucky,
Lexington, Kentucky

ROEDER, KENNETH D.,
Department of Biology,
Tufts University,
Medford 55, Massachusetts

RUDINSKY, JULIUS A.,
Entomology Department,
Oregon State College,
Corvallis, Oregon

SABROSKY, CURTIS W.,
U. S. National Museum,
Washington 25, D. C.

SLATER, JAMES A.,
Dept. of Zoology & Entomology,
University of Connecticut,
Storrs, Connecticut

SMITH, EDWARD H.,
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N. Y. S. Agricultural Experiment Station,
Geneva, New York

SNYDER, THOMAS E.,
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Washington 9, D. C.

STAY, BARBARA,
The Biological Laboratories,
Harvard University,
Cambridge 38, Massachusetts

THOMPSON, C. G.
Western Forest Biological Laboratory,
Forest Service, Cordley Hall,
Oregon State College,
Corvallis, Oregon

TOWNES, HENRY,
Museum of Zoology
University of Michigan,
Ann Arbor, Michigan

WALLIS, ROBERT C.,
Entomology Department,
Connecticut Agricultural Expt. Station,
New Haven, Connecticut

WERNER, FLOYD G.,
Department of Entomology,
University of Arizona,
Tucson, Arizona

WOOLLEY, TYLER A.
Department of Zoology,
Colorado State University,
Fort Collins, Colorado

MEETINGS

BETHESDA, MARYLAND. National Institutes of Health, October 4–7, 1960. The tenth annual Instrument Symposium and Research Equipment Exhibit. James B. Davis, *Exhibit Manager*, National Institutes of Health, Bethesda 14, Maryland.

RALEIGH, NORTH CAROLINA. North Carolina State College, October 7, 1960. The fifth annual meeting of the North Carolina Entomological Society. Frank E. Guthrie, Department of Entomology, North Carolina State College, Raleigh, North Carolina.

TULSA, OKLAHOMA. Mayo Hotel, October 16–20, 1960. The twenty-seventh annual meeting of the National Pest Control Association. Harold Schnorrenberg. *President*, 1830 Linwood, Oklahoma City, Oklahoma; R. E. Heal, *Executive Director*, National Pest Control Association, 250 West Jersey Street, Elizabeth, New Jersey.

CHICAGO, ILLINOIS. Conrad Hilton Hotel, October 21, 1960. The fourth annual Symposium on Advances in Tracer Methodology. Martin Kamen, *Chairman*, Brandeis University, Waltham, Massachusetts.

NEW YORK, NEW YORK. New Yorker Hotel, October 27–28, 1960. The thirty-second annual meeting of the Eastern Branch, Entomological Society of America. E. N. Woodbury, *Chairman*, Hercules Research Center, Wilmington, Delaware; L. G. Merrill, Jr. *Secretary*, Department of Entomology, Rutgers University, New Brunswick, New Jersey.

ATLANTIC CITY, NEW JERSEY. Chalfonte-Haddon Hall, November 28–December 1, 1960. The 1960 annual meeting of the Entomological Society of America. M. P. Jones, *President*, Extension Entomology, USDA, South Building, Rm. 4150, Washington 25, D. C.; L. G. Merrill, Jr., *Chairman, Local Arrangements Committee*, Department of Entomology, Rutgers University, New Brunswick, New Jersey; E. N. Woodbury, *Chairman, Exhibits Committee*, Hercules Research Center, Wilmington, Delaware; Roy R. Kriner, *Chairman, Photo Salon*, 216 North Carlisle, Greencastle, Pennsylvania; R. H. Nelson, *Executive Secretary*, Entomological Society of America, 4603 Calvert Road, College Park, Maryland.

HOLLYWOOD, FLORIDA. Hollywood Beach Hotel, December 3–9, 1960. The forty-seventh annual meeting of the Chemical Specialties Manufacturers Association. George W. Fiero, *President*, Esso Standard, Division of Humble Oil and Refining Company, New York, New York; A. A. Mulliken, *Secretary*, Chemical Specialties Manufacturers Association, 50 East 41st Street, New York 17, New York.

NEW YORK, NEW YORK. Commodore Hotel and other nearby hotels, December 26–31, 1960. The 1960 annual meeting of the American Association for the Advancement of Science. Thomas Park, *President*, Department of Zoology, University of Chicago, Chicago 37, Illinois; Dael Wolfle, *Executive Officer*, American Association for the Advancement of Science, 1515 Massachusetts Avenue, N.W., Washington 5, D. C.

WASHINGTON, D. C. August 21–27, 1963. The XVIth International Congress of Zoology. Alfred S. Romer, *President*, Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts.

4-H ENTOMOLOGY EXHIBITS AND DEMONSTRATIONS

Excellent facilities and plenty of space will be available for 4-H Entomology Exhibits at our Annual Meeting at Atlantic City this fall. An area of approximately 54 feet long and 19 feet wide is available for these displays. 4-H exhibits are becoming a regular part of the Annual Meeting. Ten states were represented by exhibits last year. Do not overlook this opportunity to display the talents of your 4-H members and for your state to be represented in 1960.

We hope nearby states are planning to send demonstration teams this year to the Annual Meeting. A small budget is being provided to assist with expenses of the 4-H members presenting demonstrations.

E. N. WOODBURY, *Chairman*
H. ELDON SCOTT, *Co-Chairman*
LLOYD E. ADAMS, *Co-Chairman*

MEMBERS IN THE NEWS

W. S. McLEOD, officer in charge of the Canada Department of Agriculture's Pesticide Testing Laboratory for eight years, has been appointed supervisor of the Pesticide Unit, Plant Products Division in Ottawa.

CARROLL M. WILLIAMS of Harvard University was one of the 35 new members elected to the National Academy of Sciences at its 97th annual meeting in April, 1960. He is the only entomologist in the Academy.

TYLER A. WOOLLEY was one of three recipients of Distinguished Service Awards for excellence in teaching and scholorship at Colorado State University in May. A $500.00 honorarium accompanied the award.

HARRY HOOGSTRAAL was one of six receiving Distinguished Civilian Service Awards from the Department of Defense on April 27, 1960. This is the highest honor conferred on civilian employees by the Department.

EUGENE E. KENAGA has been advanced to associate scientist in the Dow Chemical Company at Midland, Michigan.

E. G. LINSLEY formerly Chairman, Department of Entomology and Parasitology at the University of California was named Dean of the College of Agriculture at the University on April 28, 1960. He will also serve as assistant Director of the University of California Experiment Station.

HERBERT L. J. HALLER and EDWARD F. KNIPLING were among seven recipients of the U. S. Department of Agriculture Distinguished Service Award on May 17, 1960.

J. A. MUNRO has returned to Fargo, North Dakota after nearly 10 years of foreign service.

CHARLES C. FANCHER and HAROLD H. SHEPARD were among those receiving Superior Service Awards from the U. S. Department of Agriculture on May 17, 1960.

C. C. ROAN left Kansas State University for a year in New Zealand on July 8, 1960. He was awarded a Fulbright senior research scholar grant.

HAROLD MORRISON, 44 years of service and MARY J. EDMANDS, 30 years of service, are recent retirees from the U. S. Department of Agriculture.

E. F. KNIPLING and R. C. BUSHLAND were named joint winners of the Hoblitzelle National Award in the Agricultural Sciences last May. The award was in recognition of their part in the development of the sterile male screwworm control method. The award carries a $10,000.00 cash prize and a gold medal.

WALTER CARTER, ROBERT GLEN and CORNELIUS B. PHILIP were given Outstanding Achievement Awards by the University of Minnesota in June. The three entomologists all hold Doctor of Philosophy degrees from that Institution.

ROY E. CAMPBELL retired from the U. S. Department of Agriculture after 46 years of service. The event was suitably observed by the Whittier Laboratory and by the Entomological Club of Southern California.

R. D. O'BRIEN, formerly of the Canadian Department of Agriculture, has joined the entomology staff at Cornell University. T. C. WATKINS, formerly of the entomology staff, has been made Director of Resident Instruction at Cornell.

C. G. THOMPSON has transferred from Beltsville, Maryland to the Western Forest Biology Laboratory of the Forest Service in Corvallis, Oregon.

JEROME G. ROZEN JR., the editor of MISCELLANEOUS PUBLICATIONS OF THE ENTOMOLOGICAL SOCIETY OF AMERICA has left Ohio State University to become associate curator in charge of entomology at the American Museum of Natural History in New York.

EDWARD A. STEINHAUS, the editor of the ANNUAL REVIEW OF ENTOMOLOGY and a member of the Governing Board of this Society has been awarded a Gugenheim Fellowship in Entomological Research.

RECOGNITION FOR R. E. SNODGRASS

At the June Commencement of the University of Maryland, an honorary Doctor of Science degree was awarded to our Honorary Member, R. E. Snodgrass. The citation given by Dean Gordon M. Cairns follows:

ROBERT EVANS SNODGRASS

dedicated scientist, renowned scholar, and eminent leader in the field of entomology.

A graduate of Stanford University, he demonstrated an aptitude for scientific research as evidenced by his early publications while an undergraduate student.

In his remarkable professional career he made unparalleled contributions to the knowledge of insect anatamy and morphology as an entomologist with the United States Department of Agriculture, and has continued active research and publication since his retirement in 1945.

His superbly illustrated books, interpretive papers, and inspiring lectures have continued to influence the thinking of countless thousands of biologists.

As a lecturer and counselor of advance students at the University of Maryland for nearly 25 years, he played an important role in the intellectual and scientific development of many individuals. His talents as a lecturer have been sought by leading institutions.

Learned socities in the United States and in six other countries have honored him for his scientific attainments.

He is an honorary collaborator with the Smithsonian Institution and has continued as a collaborator with the United States Department of Agriculture.

Mr. President, it is my privilege to present for the honorary degree of Doctor of Science, ROBERT EVANS SNODGRASS.

UNIVERSITY OF DELAWARE

A collection of separates and reprints of articles written by William Beutenmuller have been presented to the University of Delaware, Entomology Department. The gift was made by the son of the late lepidopterist. Other donations of entomological literature have been made in recent years by F. M. Jones and by Mrs. H. F. Dietz.

ENTOMOLOGICAL REVIEW

The *AIBS Bulletin* regularly carries announcements of Russian literature which the AIBS has made available in English translations. Occasional advertisements have appeared in our publications. One of the translations of particular interest to our members is the *Entomological Review*. This quarterly publication enables interested entomologists to keep abreast of Soviet entomology. Translation and printing charges are presenting problems to the AIBS since the *Entomological Review* is not receiving the support it deserves. We suggest that each of our members should determine whether or not the library of his institution or company is subscribing for the *Entomological Review* and if not, to recommend to the library that the AIBS be asked for quotations.

YOUR LATEST PAPER—WAS IT ABSTRACTED IN BIOLOGICAL ABSTRACTS?[1]

If so, how did it happen? If not, why not? Did you prepare an abstract of your paper? Or did you leave this highly important matter to someone else? In other words—to chance?

You, the journal in which you publish, and biology, all are the losers when an abstract of one of your papers does not appear in *Biological Abstracts*. No matter in what publication your paper was originally presented, knowledge of your work is geographically more restricted than need be, is available to fewer investigators in your field of interest, when it fails to be represented by an abstract in this widely circulated abstracting service.

"I know without being notified when one of my papers 'In Press' finally comes to light in the journal," one physiologist reported recently. "Almost at once requests for reprints begin to arrive—in large numbers at first, then gradually falling off until after a couple of months I seldom receive more than an occasional request. I can name, too, the very *BA* issue that carries the abstract of this same paper: the number of reprint requests follows the pattern set by the original paper, but with one striking difference—the number of requests is much greater, falls off more gradually, and occasional inquiries come along even years later."

Perhaps you can report a similar experience, and if so, it is not surprising. *Biological Abstracts* is conspicuous in libraries of the great majority of the world's institutions of learning and research, and on the desks of individual biologists over an equally wide area. And wherever *BA* goes, knowledge of your work goes also, creating greater demand for the more detailed information to be found in your original paper.

Furthermore, you as a biologist accept an obligation to the biological community to make the results of your research as widely available as possible—this is implicit in the whole tradition of scientific publication. Since the abstract is recognized as a vital link in the chain of biological communication, logically you are the individual most concerned, the one best qualified, to present your work informatively, accurately, and clearly, in the form of an abstract.

Next, then, how can you make certain that an abstract of your paper reaches *Biological Abstracts*? You may already know that editors of about three hundred of the leading English language biological journals serve you and biology by soliciting author abstracts of all articles accepted for publication, assembling these for a given journal issue, and sending them promptly to *BA*. If you publish in one or another of these journals your course is clear—when your Editor requests it, provide him with your abstract, thoughtfully prepared, and well within the time limit allotted. If you publish in a journal where editorial responsibility for abstracts is not yet assumed, urge your Editor(s) to write *BA* to learn of the relatively simple arrangements he can make to adopt the Editor-Author Abstract Plan for his publication. Meanwhile, you may send an abstract of your paper—accompanied by a reprint, please—directly to *Biological Abstracts*. (For instruction in preparing the abstract, consult "To Those Who Write For and Use *Biological Abstracts*: A Guide," which appears among front pages in any Number 1 of recent *BA* volumes.) By so doing, you will have done your part to insert the "abstract link" in the chain of biological communication. On behalf of *BA*, we pledge to you and the biological community to discharge our obligation to the best of our ability and resources—to edit and publish your abstracts as promptly as possible.

[1] This article was prepared by Phyllis V. Parkins, Editor (Abstracts) and appeared as an editorial in *Biological Abstracts*, Volume 35(5): March 1, 1960. Because we feel so strongly that many entomologists are not making the results of their research as widely available as possible it seemed worthwhile to reprint this editorial here.

RESOLUTIONS COMMITTEE 1960

The present controversy and concern over possible adverse effects of the widespread use of pesticides, along with the various other problems now facing entomologists, the entomological profession and the pesticide industry, may make the work of the *Resolutions Committee* even more important than usual in 1960. The Committee is anxious to do the best job possible, and to utilize the best thinking and talents of the membership it represents. If you have any suggestions or ideas to present, they may be sent to any member listed below, preferably in the style of a formal resolution and with sufficient carbon copies to permit their transmittal to the other committee members without copying.

C. M. Beckham, Georgia Experiment Station, Experiment, Georgia

R. C. Bushland, Box 232, Kerrville, Texas

Leland Chandler, Entomology Department, Agriculture Hall, Purdue University, Lafayette, Indiana

E. H. Littooy, 100 Gate 5 Road, Sausalito, California

J. O. Rowell, Extension Entomologist, Virginia Polytechnic Institute, Blacksburg, Virginia

Ordway Starnes, Office of the Director, College of Agriculture, Rutgers University, New Brunswick, New Jersey

J. H. Lilly, *Chairman*, Department of Entomology, Fernald Hall, University of Massachusetts, Amherst, Massachusetts

SEAL OF THE SOCIETY

The seal of the Entomological Society of America was adopted in 1954. A. B. Gurney reported on this and on the symbolism of the emblem in Volume 1, Number 1 of the BULLETIN OF THE ENTOMOLOGICAL SOCIETY OF AMERICA. The Seal appears on the cover of all Society periodicals and on the flyleaf of all Society books.

In June, 1960, Mr. Price G. Piquett presented to the Society through the Executive Secretary a bronze replica of the Seal. This beautifully executed insignia will be placed above the door of the Society Headquarters. The size and appearance of the plaque are shown in the accompanying presentation picture.

Mr. Piquett, an entomologist with the U. S. Department of Agriculture at Beltsville and a member of the Society for more than 20 years, is herewith thanked for his thoughtful gift.

Fig. 1. Bronze society seal being presented to Executive Secretary Nelson for the Society by P. G. Piquett.

BUSINESS PROCEEDINGS OF THE FIFTEENTH ANNUAL MEETING OF THE NORTH CENTRAL BRANCH, ENTOMOMOGICAL SOCIETY OF AMERICA

Milwaukee, Wisconsin, March 23, 24, 25, 1960

BUSINESS SESSION

JAMES W. APPLE, *Presiding*
GORDON GUYER, *Secretary*

The preliminary business session of the North Central Branch was called to order by Chairman Apple at 11:35 a.m., March 23, 1960 at the Schroeder Hotel, Milwaukee, Wisconsin.

The secretary was requested to report on the activities of the Executive Committee.

Report of the Executive Committee

The first meeting of the *Executive Committee* was held at 8:05 p.m., March 22, 1960, at Milwaukee, Wisconsin. President Jones and Executive Secretary Nelson of the National Society gave brief comments regarding Society activities.

Don Hamilton, *Program Committee* chairman, presented various items for consideration for improvement of future programs. Considerable discussion followed associated with the possibility of reorganizing the Thursday program to prevent conflicts with the extension and regulatory program. The motion was made by Bussart that items 3, 4, 6, 7 and 8 of the Cereal Crop Section of the 1960 Program be moved to Friday a.m. in the East Room. Seconded by Buzicky. The motion carried unanimously.

Detailed discussion followed regarding election of section officers. No action was taken.

A motion was made by Stone that institutions and other groups should be encouraged by the *Program Committee* to pool requests regarding topics for the forthcoming meeting. Seconded by Magner. Motion carried unanimously.

A motion was made by Buzicky that a notice be placed in the *Proceedings* and also brought to the attention of members by letter regarding the voluntary submitting of abstracts of papers by authors for transmittal to *Biological Abstracts*. Seconded by Bussart. Motion carried unanimously.

A motion was made by Magner that the next branch chairman appoint a temporary committee to expedite standing orders of *Proceedings* by members, institutions, and libraries. Seconded by Stone. The motion carried unanimously.

A motion was made by Stone that the material, associated with the history of the *Proceedings*, presented by Ray Everly as a special report for the *Executive Committee*, be published in Volume 16, 1960. Seconded by Buzicky. The motion carried unanimously.

Special Report to the Executive Committee on the Proceedings

RAY T. EVERLY, *Recorder*

Proceedings of the North Central Branch of The Entomological Society of America is in its 14th year. Its predecessor, The *Proceedings of the Conference of North Central States Entomologists* dates back to 1921, when the first *Proceedings*, a typewritten copy of the minutes of that meeting of some 11 pages was issued. This would be the equivalent of 6 pages in todays Proceedings. With the exception of the year 1922, when no meeting was held, the proceedings has been issued annually. Since only 11 persons attended that first meeting it is doubtful that more than 6 complete sets are in existence. One complete set of the *Proceedings* in three bound volumes is in the entomology Library of Purdue University.

All the early issues were prepared by the person who served as Secretary at the institution where the Conference was held. Along in the 30's, to partially defray costs, a fee of 25¢ was charged to all who wished copies of the Proceedings for the current conference. This was increased to 50¢ about 1936. Until 1947 the Proceedings were purchased on a voluntary basis and no registration fee was charged. However it should be kept in mind that these meetings seldom drew more than 200 people and that costs were relatively minor, since all meetings were held on University campus or at experiment station locations where no fees for rooms, projection equipment or other hidden expenses were charged. All officers served without pay. In 1946, this voluntary subscription was still in effect. Some 189 persons attended the 1946 conference, the first meeting as a Branch, and only 95 purchased the *Proceedings*.

As near as I can determine in the years 1946 and 1947, the bulk of the publishing costs were borne by the local institution and only a small portion was charged to the Branch. However in 1948 the Branch began to bear the full cost of the *Proceedings* and a registration fee of $2.50 was charged which included copies of the publication.

In table 1, a breakdown on cost of publishing the *Proceedings* is shown. Costs based on gross, cost per 100 pages and per 100 copies sold is shown. To evaluate the true cost of the proceedings and the role it plays in supporting the Branch the cost per 100 copies is the best criterion. Costs varied throughout the period listed due to different sizes of issue and different numbers sold. No one criterion gives a true picture of relative cost.

Since the cost per 100 copies sold can be compared directly with the purchase price per 100 copies sold, it is believed to be the best measure of the costs. Since the time the price of registration was raised to $2.50 in 1953 and then an additional 50¢ in 1954, the profits per 100 copies has ranged around $158 per 100 copies.

Table 2 shows the distribution of sales of the *Proceedings*. In 1946 and 1947, with no standardized format or procedure the proceedings sold were generally those that occurred to persons attending the meetings. Not until we adopted offset printing in 1950, and on initiative by the Secretary in contacting libraries and pushing sales of the proceedings after the meetings, have we been able to reach the sales we now have.

With offset printing and a more or less established page size and format, the Proceedings passed a milestone in development. In 1959, another step forward was made when it was decided to offer the *Proceedings* as a vehicle for publication to those who desired to make use of it. With the present type of printing photographs and line drawings can be reproduced and separates and reprints can be offered to authors who wish them. In 1959 we had 21 orders for reprints and separates. After consultation with the publisher, reprints were offered at $.40 per page for separates and $2.50 per page for reprints with a minimum order of 100 copies and a minimum charge of $1.00. It is believed that separates should be charged for at $1.00 per page per 100 copies.

The prime need at the present time is to augment sales to outside persons. Last year we had standing orders for 27 copies, 25 of which went to libraries. Only 10 of these are located in the North Central States. We have sold on the average 35% of our issue to persons not residing in the North Central Branch area and to institutions, chemical companies and book dealers.

Table 1. Costs and sales of the Proceedings of the North Central Branch, E.S.A. 1946 to 1959.

Year	Pages	Copies sold	Costs			Income per 100 copies	Profit per 100 copies
			Gross	per 100 pages	per 100 copies		
	No.	*No.*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*
1946	94	95	138.10	147	145	200	55
1947	91	225	162.54	179	72	200	128
1948	120	230	265.79	221	112	200	88
1949	160	356	514.10	370	144	200	56
1950	71	420	432.60	609	103	200	97
1951	127	382	707.20	557	185	200	15
1952	105	439	593.34	565	135	200	65
1953	83	422	455.31	549	108	250	142
1954	108	426	515.84	478	121	300	179
1955	89	388	458.96	516	118	300	182
1956	80	439	571.50	714	130	300	170
1957	96	431	659.45	687	153	300	147
1958	82	409+	612.61	747	150	300	150+
1959	111	359+					
Ave.[1]	102	392	482.20	501	122	229	107

[1] 1946 through 1948 omitted from averages as part of cost was borne by the institute publishing the *Proceedings*.

Table 2. Distribution of the Proceedings of the North Central Branch, E.S.A. 1946 to 1959.

Year	Total sales	Sold to members		Sold to non-members					
				At meetings		After meeting		Total	
	No.	*No.*	*Pct.*	*No.*	*Pct.*	*No.*	*Pct.*	*No.*	*Pct.*
1946	95	?		?		?		?	
1947	225	148	65.8	38	16.9	39	17.3	77	34.2
1948	230	167	72.6	31	13.5	32	13.9	63	27.4
1949	356	233	65.4	28	7.9	81	22.8	109	34.6
1950	420	288	68.6	42	10.0	90	21.4	132	31.4
1951	382	221	57.9	42	11.0	119	31.2	161	42.1
1952	439	274	62.4	39	8.9	126	28.7	165	37.6
1953	422	283	69.4	46	10.9	93	22.0	139	30.6
1954	426	259	60.8	27	6.3	140	32.9	167	39.2
1955	388	252	65.0	50	12.9	86	22.2	136	35.0
1956	439	270	62.9	36	8.2	127	28.9	163	37.1
1957	431	299	69.4	32	7.4	100	23.2	132	30.6
1958	409	269	65.8	41	10.0	99+	24.2	140+	34.2
1959	359	265	73.8	40	11.1	54	15.1	94	26.2
Ave.[1]	406	265	65.3	38	9.4	102	25.3	140	34.7

[1] The years 1946, 1947 and 1948 are omitted from the averages as the format, method of preparation and sales promotion was entirely different than in the following years.

The parent organization will now give us some space in their regular publications, the ANNALS, JOURNAL and BULLETIN, to advertise the *Proceedings*. I would like to suggest that a card mailing list be maintained of persons buying the *Proceedings* each year so that notices *prior* to publication can be mailed these people who have not purchased the current issue at the meetings. In addition we might be able to move our stock of back issues by listing those available on these notices.

We have been ordering about 450 copies each year. If post-meeting sales can be spurred then we will have to consider ordering additional copies. Pre-publication sales must be stimulated in order to get a close estimate of the size of the issue. This might be accomplished by a price differential or merely pre-publication notice sufficiently in advance to obtain commitments to purchase.

Motion by Buzicky that the incoming chairman appoint a new committee on *Insect Surveys and Losses*, numbers to be designated by the chairman. Such committee should be encouraged to coordinate its activities with the Committee of the National Society. Seconded by Stone. The motion carried unanimously.

The time and place of the 1962 annual meeting was discussed. Purdue University and the University of Minnesota issued invitations.

Motion was made by Magner that the 1962 meeting be held at Minneapolis, Minnesota, on Wednesday, Thursday, and Friday at the time of the spring quarter break at Minnesota. Seconded by Stone. The motion was unanimously approved.

The second session of the *Executive Committee* was set for 15 minutes after the banquet program is completed.

Adjourned at 12:30 a.m.

PROCEEDINGS

On hand March 21, 1960

1930 issue	12 copies	@2.00	$ 24.00
1932 issue	1 copy	@2.00	2.00
1935 issue	1 copy	@2.00	2.00
1936 issue	1 copy	@2.00	2.00
1937 issue	2 copies	@2.00	4.00
1938 issue	2 copies	@2.00	4.00
1940 issue	35 copies	@2.00	70.00
1945 issue	66 copies	@2.00	132.00
1949 issue	15 copies (volume 4)	@2.00	30.00
1950 issue	8 copies (volume 5)	@2.00	16.00
1951 issue	4 copies (volume 6)	@2.00	8.00
1952 issue	35 copies (volume 7)	@2.00	70.00
1953 issue	26 copies (volume 8)	@2.50	65.00
1954 issue	26 copies (volume 9)	@3.00	78.00
1955 issue	50 copies (volume 10)	@3.00	150.00
1956 issue	25 copies (volume 11)	@3.00	75.00
1957 issue	12 copies (volume 12)	@3.00	36.00
1958 issue	41 copies (volume 13)	@3.00	123.00
1959 issue	91 copies (volume 14)	@3.00	273.00
Total issues	453 copies		$1164.00

Final Business Session

The final business session was called to order by Chairman Apple at 8:50 a.m., March 25, 1960, at the Schroeder Hotel, Milwaukee, Wisconsin. Chairman Apple asked for old business. Representative Bussart gave the following comments regarding Resolution No. 8 of the 1959 North Central Branch meeting:

Resolution No. 8, associated with numbering of the annual meeting of the National Society, was brought before the Governing Board of the Parent Society and after considerable discussion they agreed as follows:

a. There has not been an annual meeting each year; some years more than one.
b. Organization should and will date from 1889.
c. The seal will henceforth appear on all programs and official publications. The dates 1889, 1906, and 1953 appear on the seal.
d. Annual meetings will be designated by year and location, but not by number.

Report of the Second Session of the Executive Committee

The second session of the *Executive Committee* convened at 9:15 p.m. Thursday, March 24.

The motion was made by Magner that the hotel bill of Dr. Iltis at the 15th annual meeting be paid by the Branch. Seconded by Stone. The motion carried unanimously.

The motion was made by Bussart that a photo salon be established for 1961. Entries to be restricted to members of the North Central Branch and further restricted to color transparencies. The committees to be appointed by the incoming chairman. Seconded by Buzicky. The motion carried unanimously. Bussart moved that we adjourn at 11:00 p.m.

Brindley asked why the resolution associated with the photo salon restricted the entries to color transparencies. Chairman Apple indicated that this restriction was included in order that the Branch members might be more willing to participate under these restrictions.

Stannard asked why the restriction was included that only North Central Branch members participate. Chairman Apple stated that this was indicated in the same respect as the previous question by Dr. Brindley.

The motion was made by Gunderson and seconded by Roan that the minutes of the *Executive Committee* be accepted. Unanimously approved.

The chairman then called for the treasurer's report.

Treasurer's Report

MARCH 24, 1959 TO MARCH 1, 1960

Balance from March 24, 1959.....	$ 750.21	
Receipts during the year.....	1066.72	
Total.....		$1816.93
Disbursements during the year.....	$1098.21	
Balance on hand, March 22, 1960...	718.72	
Total		$1816.93

Report of the Auditing Committee

The *Auditing Committee* has examined the records of the treasurer and found them correct and in good order.

Respectfully submitted,
PAUL LICHTENSTEIN
M. CURTIS WILSON, *Chairman*

It was moved by Wilson and seconded by Gunderson that the report of the *Auditing Committee* be approved. Unanimously approved.

Report of the Membership Committee

The *Membership Committee* operated, as in the past, by selecting state representatives to contact prospective ESA members. In addition to contacting eligible students, an attempt was made to gather in the "missing entomologists". This was done by contacting entomologists and personnel in allied professions who have recently attended our Branch meetings but who have not joined the ESA, and by soliciting unpaid 1958 members to remind them of the advantages and opportunities of remaining members of the ESA.

Forty-five applications for membership in the ESA were received from the North Central Branch area from March, 1959, to December, 1959. From December, 1959, to March, 1960, an additional 40 applications were received. This gives a total of 85 applicants for the Branch during the period March, 1959, to March, 1960.

As of this date there are 890 members of the North Central Branch, ESA. This membership is exceeded only by the Eastern Branch (1,189 members) and the Pacific Branch (1,113 members).

Maximum coordination of the activities of the ESA *Membership Committee* and the Branch *Membership Committee* was obtained by Chairman Apple through appointment of the ESA *Membership Committee* member as Chairman of the Branch *Membership Committee*. This procedure is strongly recommended to future Branch Chairmen to avoid duplication of membership recruiting activities.

Respectfully submitted,
JOHN A. LOFGREN
ROBERT STAPLES
ROY W. RINGS, *Chairman*

The motion was made by Lofgren that the *Membership Committee* report be approved, seconded by Harris, carried unanimously.

Report on the Committee on Sustaining Associates

In the absence of any of the Committee members the list of sustaining associates was read by Secretary Guyer and an indication was made that two new members, The J. L. Hudson Company and the Diamond Alkali Company, had been added during 1959–60.

Report of the Resolutions Committee

RESOLUTION No. 1

WHEREAS, the success of this 1960 Milwaukee Conference of the North Central Branch of the Entomological Society of America has resulted from the contributions of many persons,

BE IT RESOLVED, that our thanks and appreciation be extended to the Branch Officers and members of the Executive, Program, and Local Arrangements Committees for 1959, and to the management of the Hotel Schroeder, and

BE IT FURTHER RESOLVED, that our appreciation be made known to M. P. Jones, President of the Entomological Society of America, for his attendance and contributions.

RESOLUTION No. 2

WHEREAS, the Program of these meetings has been printed for the fifth consecutive year through the courtesy of the Midwest Farm Paper Unit, comprised of *The Farmer*, St. Paul, Minnesota; *The Nebraska Farmer*, Lincoln, Nebraska; the *Prairie Farmer*, Chicago, Illinois; *Wallaces Farmer*, Des Moines, Iowa; and the *Wisconsin Agriculturist*, Racine, Wisconsin,

BE IT RESOLVED, that the Branch thank these companies for the programs by having the Secretary write to them individually, appropriately expressing our appreciation.

RESOLUTION No. 3

WHEREAS, the opening of the Saint Lawrence Seaway permits ships from all over the world to discharge cargoes in the agricultural heartland of the United States, directly exposing this area to the hazards of foreign insect pests, and

WHEREAS, entomologists of the North Central Branch recognize their responsibility to the public with regard to agriculture and public health,

BE IT RESOLVED, that the membership of the Branch be alerted concerning this hazard and make every effort to detect the presence of any new pests.

RESOLUTION No. 4

WHEREAS, we learn with deep regret of the following members of the North Central Branch who have passed to their reward since our last meeting:
Howard H. Jewett of Lexington, Kentucky
and
Paul S. Welch of Ann Arbor, Michigan
therefore

BE IT RESOLVED, that the Secretary express the deepest sympathy of the Branch to the families of these men.

Resolutions Committee,
JAMES R. DOGGER
WILLIAM S. VAN SCOIK
PAUL A. DAHM, *Chairman*

The four resolutions were accepted unanimously.

Report of the Nominating Committee

The Nominating Committee reported that the newly elected officers for the Branch were:

Executive Committee Member-at-Large	—	J. V. OSMUN
Representative to the Governing Board	—	R. H. DAVIDSON
Chairman-Elect	—	L. K. CUTKOMP

The newly elected officers were conducted to the podium and introduced to the membership. Chairman Apple yielded the gavel to the new chairman, D. M. DeLong. Chairman DeLong announced that the 1961 meeting would be held at Kansas City, Missouri, on March 22, 23, and 24, 1961.

Chairman DeLong asked for new business and the following items were considered:

Amendments to the By-Laws proposed by Apple. The material in parenthesis is to be deleted, that in italics is to be added.

ARTICLE II

Section 5. The officers and the Executive Committee Members at Large, unless otherwise specified, shall be elected by written ballot at the annual meeting of the Branch. (Their) *The* terms of office *for all but the Representative to the Governing Board* shall begin at the close of the meeting at which they are elected. *The newly elected Representative to the Governing Board shall not take office until the final business session at the subsequent annual meeting of the Entomological Society of America.*

Section 5 as amended was moved to be accepted by Brindley, seconded by Burkhardt, approved unanimously.

Section 6. (At the annual meeting the Chairman) *The Executive Committee* shall (appoint) *select* a Nominating Committee which shall consist of three Active Members not currently holding office. It shall be the duty of this committee to nominate two candidates for each office where vacancies occur or terms of service of incumbents are due to expire at the following annual meeting. This Nominating Committee shall report its nominations to the Chairman and to the Secretary-Treasurer. The Secretary-Treasurer shall announce the roster of candidates to the Active Members not less than one month prior to the annual meeting. Additional nominations may be made in writing to the Secretary-Treasurer by any five Active Members at any time previous to balloting. In case of tie vote for any office the Nominating Committee shall decide the tie.

Section 6 was moved for acceptance by Buzicky, seconded by Harris, approved unanimously.

ARTICLE IV

Section 1. The Chairman shall appoint such committees as may be needed, including those of (Nominations), Program, Local Arrangements, Auditing, and Resolutions.

Mickel moved this be accepted, seconded by Gunderson, approved unanimously.

Chairman DeLong appointed the following committees:

Program:
L. CHANDLER
N. D. WYGANT
Chairman—C. C. BURKHARDT

Local Arrangements:
Registration—W. R. ENNS
Public Relations—R. R. SCHENDEL
Exhibits—H. E. THOMPSON
Banquet—H. R. SHUYLER
Projection Equipment—J. H. CAMIN
Special Events—R. E. BEER
Ladies Program—MRS. R. E. BEER
Chairman—G. W. BYERS

Resolutions:
S. A. GRAHAM
L. B. DANIELS
Chairman—R. C. DOBSON

Membership:
L. H. TOWNSEND
R. D. PRICE
Chairman—J. P. SLEESMAN

Auditing:
W. R. HORSFALL
Chairman—J. W. BUTCHER

Recording:
G. E. Guyer
Chairman—R. T. Everly

Sustaining Associates Committee:
J. E. BUSSART

Committee on Insect Surveys and Losses:
O. H. HAMMER
L. L. PETERS
Chairman—C. E. WHITE

Proceedings Promotion Committee:
R. T. EVERLY
R. E. HILL
A. G. PETERSON
H. B. PETTY
Chairman—R. W. RINGS

Photo Salon Committee:
L. STANNARD
R. H. DAVIDSON
Chairman—D. T. Ries

Final business meeting adjourned at 9:20 a.m.

A meeting of the new *Executive Committee* was held immediately and the following *Nominating Committee* was approved:

H. B. MILLS
R. L. WENZEL
Chairman—H. GUNDERSON

Respectfully submitted,
GORDON GUYER
Secretary-Treasurer

FROM THE MANAGING EDITOR'S DESK

"Scratch my back . . ."—This is the title of a recent editorial which appeared in *Biological Abstracts* Volume 35(16): August 15, 1960 emphasizing the importance of advertising in *BA* and how the advertisers in *BA* actually pay part of the subscription price—because every cent of income received goes back into the service. If, therefore, income from any source is materially decreased it would be necessary either to increase subscription prices or curtail the services rendered in order to maintain a balanced budget.

The old saying that "it pays to advertise" still is true . . . *if* the right media are selected. Advertisers use *BA* to tell you about their products and services and since they are in business for profit, they expect a reasonably good response. It's a two-way deal—you buy what they have to offer or direct business to them and they will continue to buy advertising space. In effect they are saying "you scratch my back and I'll scratch yours." It is only through the cooperation of those who use *BA* that it can be made the *right* advertising medium.

What is true for *BA* is also true of the publications of the Entomological Society of America. The large national advertisers depend upon television, radio, and the popular magazines with circulations in the millions to promote the sale of consumer goods and services and through such media they reach a large cross section of the population. On the other hand, publishers of technical books and manufacturers and distributors of technical products and services can not afford to use such media to reach the comparatively small percentage that might be interested in whatever they have to sell. They must select media that reach this small percentage almost exclusively. Advertisers wishing to reach scientists will therefore choose scientific journals as no better medium could be used than journals published for the exclusive benefit of research scientists and teachers in this field of endeavor.

Income derived from advertising in our Society's publications while not as large as it should be has helped to defray expenses. At present we are not in a position to embark on a really effective promotion campaign. We appeal to our readers, therefore, for help in interesting advertisers in our publications—not only for the revenue from the sale of advertising space, but also because it will help you keep better informed on new books, laboratory equipment and apparatus, methods, pesticides, et cetera—the tools you use in your profession.

We appeal to you also to read the advertisements in our journals and patronize these advertisers—making sure to mention the Entomological Society of America.

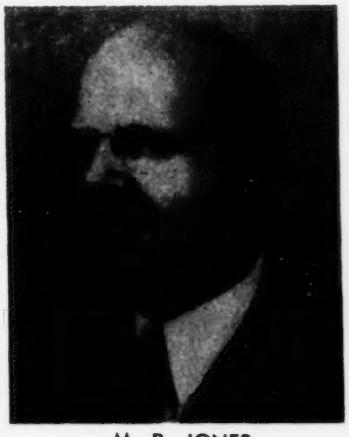
RESULTS OF 1959 FUNGICIDE AND NEMATOCIDE TESTS

The *Results of 1959 Fungicide and Nematocide Tests* is now available. This report is issued annually by the American Phytopathological Society Advisory Committee on Collecting and Disseminating New Fungicide Data. This report serves as a medium for organizing and presenting the summarized results of current fungicide and nematocide testing projects. Much of the information is never otherwise published or made conveniently available. Information on products available for testing, composition of products and their sources are given.

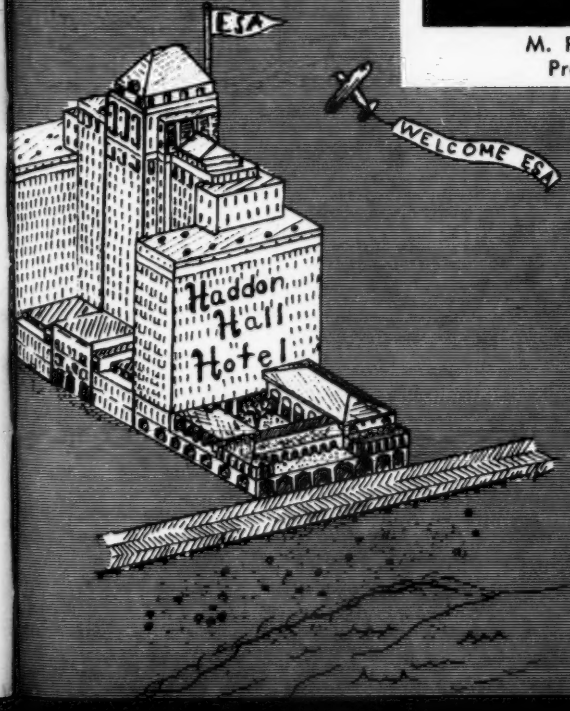
Copies of this report are available at $1.00 per copy when accompanied by a remittance, $1.25 when invoiced and billed. Address orders to A. B. Groves, Winchester Fruit Research Laboratory, Route 3, Winchester, Virginia. Make remittances payable to the American Phytopathological Society.

1960 ATLANTIC CITY MEETINGS

NOVEMBER 28 - DECEMBER 1



M. P. JONES
President



ENTOMOLOGICAL SOCIETY OF AMERICA

Entomological Society of America

M. P. Jones, *President*

H. M. Harris, *President-Elect* — R. H. Nelson, *Executive Secretary*

GOVERNING BOARD

J. E. Bussart
Roy Hansberry
H. M. Harris
M. P. Jones
D. R. Lindsay
E. G. Linsley
C. M. Meadows
R. H. Nelson
L. D. Newsom
P. W. Oman
C. B. Philip
Morris Rockstein
R. W. Sherman
E. A. Steinhaus
Neely Turner

PROGRAM COMMITTEE

Ralph W. Sherman, *Chairman*
Edward H. Smith
Dan O. Wolfenbarger

COMMITTEE ON LOCAL ARRANGEMENTS

L. G. Merrill, Jr., *Chairman*
D. F. Bray, *Vice-Chairman*
D. Lyle Goleman
L. E. Hagmann
J. L. Libby
H. F. Pierce
H. L. Smith
D. E. Ullrich

LADIES ENTERTAINMENT COMMITTEE

D. L. Watson, *Chairman*
Wives of the members of the *Local Arrangements Committee*

EXHIBITS COMMITTEE

E. N. Woodbury, *Chairman*
L. E. Adams
Arnold Mallis
A. A. Muka
H. Eldon Scott
D. R. Shepherd

MEMORIAL LECTURE COMMITTEE

C. B. Philip, *Chairman*
L. D. Newsom
R. W. Sherman
B. N. Smallman
E. A. Steinhaus

PHOTOGRAPHIC SALON COMMITTEE

Ray R. Kriner, *Chairman*
J. Alfred Adams
J. R. Hoffman
J. O. Pepper
P. L. Polis

PUBLICITY COMMITTEE

B. B. Pepper, *Chairman*
Sam Reck

RESOLUTIONS COMMITTEE

J. H. Lilly, *Chairman*
C. M. Beckham
R. C. Bushland
Leland Chandler
E. H. Littooy
J. O. Rowell
Ordway Starnes

SECTION AND SUB-SECTION OFFICERS

A. General Entomology

A. B. Gurney, *Chairman*
Lewis Berner, *Vice-Chairman*
W. W. Wirth, *Secretary*

Sub-Section A-b, Teaching

A. C. Cole, Jr., *Chairman*
W. R. Enns, *Vice Chairman*
E. W. King, *Secretary*

B. Insect Physiology and Toxicology

F. W. Fisk, *Chairman*
M. S. Blum, *Vice Chairman*
D. L. Shankland, *Secretary*

C. Insect Biology

G. H. Kaloostian, *Chairman*
W. C. Rothenbuhler, *Vice Chairman*
F. L. McEwen, *Secretary*

Sub-Section C-a, Biological Control

J. D. Briggs, *Chairman*
I. M. Hall, *Secretary*

Sub-Section C-b, Apiculture

R. A. Morse, *Chairman*
T. S. K. Johannson, *Secretary*

Sub-Section C-c, Insect Vectors of Plant Diseases

K. Maramorosch, *Chairman*
J. N. Simons, *Vice Chairman*
O. A. Hills, *Secretary*

Sub-Section C-d, Ecology and Bionomics

G. G. Gyrisco, *Chairman*
F. R. Lawson, *Vice Chairman*
J. A. Adams, *Secretary*

D. Medical and Veterinary Entomology

Carroll N. Smith, *Chairman*
George L. Hutton, *Vice Chairman*
Cluff E. Hopla, *Secretary*

E. Control, Extension and Regulatory Entomology

E. P. Reagan, *Chairman*
C. R. Jordan, Jr., *Vice Chairman*
L. G. Davis, *Secretary*

Sub-Section E-a, Extension

L. E. Adams, *Chairman*
A. G. Bennett, *Vice Chairman*
P. H. Wooley, *Secretary*

Sub-Section E-b, Plant Pest Control and Quarantine

J. J. Favinger, *Chairman*
W. E. Blasingame, *Vice Chairman*
G. G. Rohwer, *Secretary*

F. Chemical Control Investigations

R. J. Norton, *Chairman*
M. M. Barnes, *Vice Chairman*
T. R. Hansberry, *Secretary*

TRAVEL TO ATLANTIC CITY, NEW JERSEY

Atlantic City, the site of the 1960 Meeting of the Entomological Society of America, can be reached by car, bus, railroad, or airplane. By car it can be reached from the north using the Garden State Parkway (toll), from the west by U. S. Routes 30 or 40. All of the above roads connect with the New Jersey Turnpike (toll) and the New York Thruway (toll). There are several parking lots near the hotel for personal cars.

If you cannot drive to Atlantic City the next easier mode of travel is to fly into either Philadelphia or New York City and take a non-stop bus to Atlantic City. In New York contact the Port Authority Bus Terminal, Eighth Avenue and 41 Street, Telephone LOgan 5-7040 or the Lincoln Transit Company, Telephone PEnnsylvania 6-1640. In Philadelphia, contact the Public Service Bus Company at Union Terminal, 13 Street and Filbert Street, Telephone LOcust 7-4300. All of these companies have several trips each day including Sundays direct to Atlantic City.

There is only one train, the Pennsylvania-Reading Seashore Lines, going to Atlantic City. This train leaves from Philadelphia several times daily and Sundays. Check your travel agent for times of departure. Allegheny and Eastern Airlines fly regularly to Atlantic City. Main points of departure are Newark, Washington, Philadelphia, and Pittsburgh. Service is limited, so if you plan to fly be sure to place your reservation early.

The Chalfonte-Haddon Hall is located at North Carolina Avenue at the Boardwalk. You will have no difficulty in locating the hotel.

SPECIAL EVENTS

MEMORIAL LECTURE. *Haddon Hall Hotel, Lounge Floor, Vernon Room.* Monday, 10:00 a.m. The 1960 lecture, which is in honor of John Henry Comstock, will be delivered by Dr. A. W. A. Brown. The lecture is sponsored by one of our Sustaining Associates, the BIOFERM CORPORATION of WASCO, CALIFORNIA.

ENTOMOLOGISTS' MIXER. *Chalfonte Hotel, Lounge Floor, Carolina Room.* Monday, 6:30 to 7:30 p.m. Admission is by registration badge and is complementary. All registrants are cordially invited to this traditional event.

INSECT PHOTOGRAPHIC SALON. *Haddon Hall Hotel, Lounge Floor, Vernon Room.* Monday, 8:00 p.m., Projection of transparencies and movies. *Haddon Hall Hotel, Lounge Floor, Sun Porch.* Duration of meeting, Exhibits of prints. This is the third annual salon.

ENTOMOLOGISTS' BANQUET. *Haddon Hall Hotel, Lounge Floor, Vernon Room.* Tuesday, 6:30 p.m., Informal dinner, admission is by ticket. Tickets are to be purchased at the Registration Desk. The Entomologists' Banquet is always a highlight of our meeting.

HOSPITALITY SUITES. Companies maintaining hospitality suites in the hotel may leave room numbers or group invitations at the Members' Information Desk. It is requested that these suites be closed during scheduled meeting sessions and at 1:00 a.m.

SPECIAL NOTICE

REGISTRATION DESK. *Haddon Hall Hotel, Lounge Floor, Stair Hall*—Sunday, November 27, 5:00–9:00 p.m. Monday, November 28, through Wednesday, November 30, 8:00 a.m.–5:00 p.m. Thursday, December 1, 8:00 a.m.–12:00 m. Special section for ladies.

REGISTRATION FEE. Members, including Invited Speakers, $5.00; Student Members, $1.00; Non-Members, $7.50; Non-Member Guest Speakers, no charge. Wives of members, no charge except for activity fees.

MEMBERS' INFORMATION DESK. Near the Registration Desk. Society business and information other than registration. Mrs. Louise B. Stone, Administrative Assistant from the College Park office, will be in charge of this desk.

JOBS—AVAILABLE AND WANTED. If you are seeking employees or employment, please make inquiry at the Members' Information Desk. Forms for essential information will be supplied. Be sure to enter a local contact address and/or phone number on the form.

MEETING SCHEDULE. All presiding officers and speakers are to conform exactly to the time schedules as given in the program. A recess is to be taken when a speaker is not present. Speakers should allow time for discussion.

AMONG OUR GUEST SPEAKERS

DR. DIONYZ BLASCOVIC, *Director of the Institute of Virology* at Blatislava, Czechoslovakia, will speak on the subject, "Ticks as Virus Vectors in Eastern Europe," at the plenary joint symposium on Tuesday afternoon, November 29.

DR. KENNETH C. WILLETT, *Director of the West African Institute for Trypanosomiasis Research*, Kaduna, Northern Nigeria, is also a speaker at the Tuesday afternoon plenary symposium. His subject is "Recent Advances in the Study of Tsetse Fly-Borne Diseases."

The Society extends its appreciation to the Rockefeller Foundation for the financial arrangements which made possible the appearance of Drs. Willett and Blascovic on our program.

DR. J. GEORGE HARRAR, *Vice President of The Rockefeller Foundation*, New York, will address the plenary session of the Society Tuesday afternoon, speaking on the subject, "Food Additives and Public Health." Dr. Harrar was formerly Director of the Foundation's Agricultural Program. He served as a member of the Panel on Food Additives of the President's Science Advisory Committee. This special panel of experts made a most realistic report on the use of chemicals and drugs as food additives. It is felt that the Committee's findings had far too little publicity in view of the manner in which contrary views have been aired in the public press. We, therefore, welcome the opportunity to hear Dr. Harrar on this subject.

Other plenary addresses by invited speakers are as follows:

ALBERT S. PERRY, Communicable Disease Center, USPHS, HEW, Savannah, Ga. "The Contributions of Insect Physiology and Toxicology to Human Welfare." Sponsored by Section B. Tuesday afternoon.

E. F. KNIPLING, Entomology Research Division, ARS, USDA, Beltsville, Md. "Contributions of Medical and Veterinary Entomology to Human Welfare." Sponsored by Section D. Wednesday afternoon.

LESTER G. MACNAMARA, Chief, Bureau of Wildlife Management, N. J. Department of Conservation and Economic Development, Trenton. "The Role of Chemicals in Wildlife Conservation." Sponsored by Section E. Wednesday evening.

HARLOW B. MILLS, Illinois Natural History Survey, Urbana. "Insects' Greatest Competitor." Sponsored by Section A. Thursday morning.

OUR 1960 THEME

As announced in the Program Highlights appearing in the June ESA Bulletin, our theme this year is—

Entomological Contributions to Human Welfare

Section and Sub-Section officers have been quite successful in arranging their programs to emphasize this topic. Stimulating and informative speakers at plenary and Section sessions will further develop and amplify it.

SPECIALIZED SESSIONS

Face Fly Symposium. Section D. **Tuesday, 9:00–11:00.**

Heliothis Conference. Non-Sectional. **Tuesday, 9:00–11:45.**

Insect Genetics Session. Sub-Section C-d. **Tuesday, 9:48–11:45.**

Joint Session, Section B and Biometric Society. **Tuesday, 9:00–11:24.**

ENTERTAINMENT FOR THE LADIES

MONDAY, NOVEMBER 28

9:45 A.M. **TRIP TO LENOX CHINA PLANT, by bus.** Meet at Ladies' Headquarters in the Card Room, Haddon Hall lobby at 9:45 a.m. Buses will leave at 10 and 10:30 a.m. to visit the Lenox China Plant. Buffet lunch at Smithville Inn. Obtain tickets at Ladies' Registration Desk. Approximate charge per person, $4.50.

6:30 to 7:30 P.M. **MIXER in the Carolina Room of The Chalfonte.** Sponsored by ESA. Ladies are invited to attend with their husbands or escorts.

8:00 P.M. **PHOTO SALON, Vernon Room, Haddon Hall.** Exhibition of slides and movies.

TUESDAY, NOVEMBER 29

9:00 to 11:30 A.M. **Visits** to stores and piers along the boardwalk suggested.

12:00 Noon Meet at **Ladies Headquarters** for Dutch treat lunch at Hotel.

1:30 P.M. Return to **Card Room** for an afternoon of cards. Coffee, tea, and cookies will be served. Approximate cost per person, $1.25.

6:30 P.M. **BANQUET in Vernon Room, Haddon Hall.** Attend with husbands or escorts.

WEDNESDAY, NOVEMBER 30

10:30 A.M. Meet in **Ladies' Headquarters** at 10:30. Lunch together. Return to Headquarters at 12:15 to board buses for **TRIP TO RENAULT WINERY.** Obtain tickets at Ladies' Registration Desk. Approximate cost per person, $1.50.

7:30 P.M. **PLENARY SESSION, Vernon Room.** 4-H Club Demonstration. Invitational Address by Lester G. MacNamara, and Report of XIth International Congress of Entomology, Vienna, Austria, August 17 to 25, 1960. Illustrated.

THURSDAY, DECEMBER 1

10:30 to 11:30 A.M. Meet in **Ladies' Headquarters** for coffee and sandwiches. Approximate cost per person, $1.15.

11:30 on **Open.**

PAPERS BY ENTOMOLOGISTS FROM ABROAD

ERNESTO DORESTE S, of Fundacion Shell, Cagua-Edo, Aragua, Venezuela, will attend and present a paper on "Preliminary Notes on Some Mites of Economic Importance in Various Crops and their Control in Central Venezuela" at the Section F meeting, Tuesday morning.

CHARLES D. LE SAR, Cia. Bananera de Costa Rica (United Fruit Company), Palmar Research Station, Palmar, Costa Rica, will present a paper on "Notes on the Biology of *Orasema costaricensis* Wheeler & Wheeler" at the Sub-Section C-d meeting, Wednesday morning.

MARTIN SHERMAN and ERNEST ROSS of the University of Hawaii, Honolulu, have a paper "Toxicity to House Fly Larvae of Droppings from Chicks Administered Insecticides in Feed or Water" to present to Section D, Wednesday morning.

SAMIR F. EL-MINIAWI, Locust Research Station, Plant Protection Dept., Ministry of Agriculture, Cairo, Egypt, U.A.R., presents "Developmental Sensitivity of the Desert Locust to Gamma Radiation—Part 1: Hatchlings" to Section B, Wednesday afternoon.

FUTURE MEETING PLACES

1961—Miami, Florida. McAllister Hotel.
November 27–30.

1962—Phoenix, Arizona. Westward Ho Hotel.
December 3–6.

1963—St. Louis, Missouri. Sheraton-Jefferson Hotel
December 2–5.

ARRANGEMENT OF THE PRINTED PROGRAM

All concurrent sessions are listed together, by title and author(s), symposia speakers, invited speakers, or panel participants. If five or more sessions are running at the same time, they will be found on facing left and right pages, with the time schedule in the first column of the left page. For example, all those participating in the 8 concurrent Section and Sub-section programs at 9:00 a.m., Tuesday, November 29, will be found on the two facing pages for that time and date.

When four or fewer sessions are in progress, similar information concerning all such sessions will be found on a single, appropriately titled page. Synopses of submitted papers, the only ones that are numbered, will be found under the corresponding paper number farther back in the program.

An index of authors, both senior and junior, on the final inside pages will direct you to the respective page where a particular paper is listed by title and author. If interested in a synopsis of the paper, the "Synopses" portion of the program can be readily consulted. Here papers are segregated by Section and Sub-section and are listed in numerical order.

Appreciation is expressed to those authors who followed the Program Committee's request for short titles and 50-word synopses, the latter typewritten or legibly printed in a form suitable for submitting directly to the printer. This eliminated considerable typing and editing. It also permitted use within available space of the block charts that appear herein.

THE JOHN HENRY COMSTOCK MEMORIAL LECTURE

Our Lecturer

Dr. A. W. A. Brown, Head of the Department of Zoology, University of Western Ontario, London, Ontario, was the unanimous choice of the 1960 *Memorial Lecture Committee* to deliver the annual Memorial Lecture. The title of his lecture is "The Challenge of Insecticide Resistance."

A. W. A. Brown

Dr. Brown's specialties are insect physiology and toxicology. He was born in England. He received his B.S. degree from the University of Toronto in 1933, where he was a fellow 1934–36, and was awarded M.A. and Ph.D. degrees in 1935 and 1936, respectively. His scientific career includes service as assistant biologist at the University of Toronto from 1933–34; research fellow, Royal Society of Canada, London, 1936–37; assistant entomologist in charge of the Canadian Forest Insect Survey, Canada Department of Agriculture, 1938–42; associate professor of zoology, University of Western Ontario, 1947–49, and professor and head of the Department of Zoology at the same institution from 1949. During summers from 1948 through 1954 he assisted the Canada Department of Agriculture and Defense Research Board in developing large-scale methods for controlling mosquitoes and blackflies.

Dr. Brown's research activities, in collaboration with graduate students, have been devoted to studies on the mode of action of insecticides (1948–56), factors that attract mosquitoes to mammals (1948–), and biochemistry and genetics of insecticide resistance (1958–).

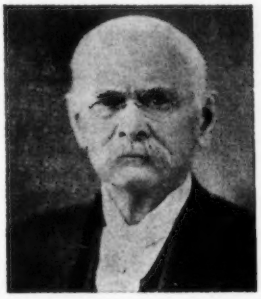
He has served at various times on the following panels and committees, and in the several capacities listed: Entomology Research Panel, Defense Research Board of Canada; Vector Control Panel, National Research Council, U. S. A.; Editorial Committees of the Annual Review of Entomology, Journal of Economic Entomology, and the Canadian Entomologist; Director, Entomological Society of Canada; Regional Director, American Mosquito Control Association; and a Sectional Chairman of the Entomological Society of America.

Among Dr. Brown's publications are approximately 75 papers and reviews. His best known publications are his books, "Insect Control by Chemicals," published in New York, 1951; "Entomology: Medical and Veterinary" (with D. N. Roy) published in Calcutta, 1954; and his latest volume "Insecticide Resistance in Arthropods," being Monograph Series No. 38 of the World Health Organization, published in 1958.

Internationally, Dr. Brown served as a Biologist with the World Health Organization at Geneva, 1956–58, where he directed the coordination of work on insect resistance to insecticides throughout United Nations countries. Finally, during 1959–60, he has served as a Consultant to the World Health Organization. During his United Nations' affiliations he has visited laboratories and conferred with entomologists in 56 countries.

The Man We Honor

The "founding father" to be memorialized in 1960 is Professor John Henry Comstock. The memory of Dr. L. O. Howard was similarly honored in 1958 and Professor C. V. Riley's contributions to entomology were recognized in 1959. The 1961 lecture will be dedicated to Thomas Say.



John Henry Comstock

John Henry Comstock was born at Janesville, Wis., February 24, 1849. He was 82 years old at the time of his death on March 20, 1931. When he established the department of entomology at Cornell University in 1875, he inaugurated the first university department of science to be founded anywhere. He graduated from Cornell University with the degree of B.S. in 1874, studied at Yale University in 1874–75, and took further work at the University of Leipzig in 1888–89. He began his faculty association with Cornell University as an instructor in 1875, serving in that capacity until 1878. He was entomologist of the U. S. Department of Agriculture in Washington from 1879 until 1881, when he returned to Cornell University as professor of entomology and head of that department. During the following 34 years he continued his active professorship as one of the outstanding teachers of entomology in the world. He became professor emeritus in 1914. Professor Comstock trained many men in our profession, thus exerting a great influence on the development of entomology in both the United States and abroad. His notable contributions to the advancement of entomological science raised him to the foremost ranks among American entomologists; at the same time establishing the department he led as one of the most celebrated entomological institutions in America.

He was a member of all the important American entomological societies. He was also an honorary fellow of the entomological societies of Belgium, France, and London.

Besides his important work on scale insects, much of which was performed in California in 1880, he was an authority on insect classification, anatomy, and biology. In addition to his important papers and reports, he was the author of "A Manual on the Study of Insects," with Anna Botsford Comstock, 1895; "Insect Life," 1891; "Introduction to Entomology," 1888; "How to Know the Butterflies," also with Anna Botsford Comstock, 1904; "The Spider Book," 1912; and finally "The Wings of Insects," 1918. He was the author of some 13 interesting and important species of California insects.

The Society is itself honored in recognizing the enhancement of its profession by another "founding father," Professor John Henry Comstock.

CONDENSED PROGRAM

Plenary Sessions

MONDAY, NOV. 28

9:00—*Welcome,* MAYOR JOSEPH ALTMAN.
9:15—Announcements.
9:30—*Presidential Address,* M. P. JONES.
10:00—*Memorial Lecture,* A. W. A. BROWN.
11:00—Preliminary Business Meeting of the Society.

TUESDAY, NOV. 29

1:15—*Invitational Address,* J. GEORGE HARRAR.
1:45—*Invitational Address,* ALBERT S. PERRY.
2:30–5:00—Joint Symposium, C, C-c, C-d, D.

WEDNESDAY, NOV. 30

3:30–4:00—*Invitational Address,* E. F. KNIPLING.
4:00–5:30—Final Business Meeting of the Society.
7:30—4-H Club Demonstration.
7:45—*Invitational Address,* LESTER G. MACNAMARA.
8:15—Report of the XIth International Congress of Entomology, Vienna.

THURSDAY, DEC. 1

9:00–9:30—*Invitational Address,* HARLOW B. MILLS.

Special Events

MON., NOV. 28— **6:30– 7:30,** Mixer.
8:00 Photo Salon.
TUES., NOV. 29— **6:30** Banquet.

All Sections

MON., NOV. 28— **1:30– 1:54,** Preliminary Sectional Business Meetings.
WED., NOV. 30—**11:36–12:00,** Final Sectional Business Meetings.

Section A

MON., NOV. 28— **1:54– 4:06,** Symposium.
4:06– 4:18, Paper No. 1.
TUES., NOV. 29— **9:00–10:00,** Invited Speakers.
10:00–11:24, Papers Nos. 2–7.
WED., NOV. 30— **9:00–11:36,** Symposium.
1:30– 2:18, Invited Speakers.
2:18– 3:30, Papers Nos. 8–13.

Sub-Section A-b

WED., NOV. 30— **9:00–11:36,** Symposium.

Section B

MON., NOV. 28— **1:54– 5:18,** Papers Nos. 14–29.
TUES., NOV. 29— **9:00–11:24,** Joint Session with Biometric Society.
11:24–11:36, Paper No. 30.
WED., NOV. 30— **9:00–11:36,** Papers Nos. 31–43.
1:30– 3:30, Papers Nos. 44–53.
THURS., DEC. 1— **9:36–12:24,** Papers Nos. 54–66.
1:30– 2:54, Papers Nos. 67–72A.

Sub-Section C-a

MON., NOV. 28— **4:18– 5:18,** Papers Nos. 73–77.
WED., NOV. 30— **9:00–10:00,** Invited Speaker.
10:12–11:36, Papers Nos. 78–84.
1:30– 3:30, Papers Nos. 85–94.

Sub-Section C-b

MON., NOV. 28— **1:54– 4:12,** Symposium.
TUES., NOV. 29— **9:00–11:45,** Symposium.

Sub-Section C-c

MON., NOV. 28— **1:54– 4:18,** Joint Symposium I; C, C-c, C-d, D.
WED., NOV. 30— **9:00–10:00,** Papers Nos. 97–101.

Sub-Section C-d

TUES., NOV. 29— **9:00– 9:48,** Invited Speaker.
9:48–11:45, Insect Genetics Papers Nos. 103–109.
9:00–11:45, Heliothis Conference.
WED., NOV. 30— **9:00–11:36,**Papers Nos. 111–122.
1:30– 3:30, Papers Nos. 123–132.
THURS., DEC. 1— **9:36–12:00,** Papers Nos. 133–144.

Section D

TUES., NOV. 29— **9:00–11:00,** Face Fly Panel Discussion.
11:24–11:36, Paper No. 145.
2:30– 5:00, Joint Symposium II, C, C-c, C-d, D.
WED., NOV. 30— **9:00– 9:24,** Invited Speaker.
9:24–11:36, Papers Nos. 146–155.
1:30– 3:30, Papers Nos. 156–165.
THURS., DEC. 1—**10:36–10:48,** Paper No. 166.

Section E

MON., NOV. 28— **1:54– 4:42,** Panel Discussion.

Sub-Section E-a

TUES., NOV. 29— **9:00–11:45,** Symposium I.
THURS., DEC. 1— **9:36–12:36,** Symposium II.

Sub-Section E-b

WED., NOV. 30— **9:00–11:00,** Symposium.

Section F

MON., NOV. 28— **1:54– 4:06,** Symposium.
TUES., NOV. 29— **9:00–11:36,** Papers Nos. 168–179.
WED., NOV. 30— **1:30– 3:30,** Papers Nos. 180–189.
THURS., DEC. 1 — **9:36– 9:48,** Paper No. 190.

GENERAL PROGRAM

Monday, Nov. 28

OPENING SESSION—Vernon Room

9:00 a.m. **Welcome**—THE HONORABLE JOSEPH ALTMAN
Mayor, Atlantic City, N. J.

9:15 a.m. **ANNOUNCEMENTS**

9:30 a.m. **Presidential Address:**
Selling Insect Control Information.
M. P. JONES, *President*, Entomological Society of America.

10:00 a.m. **John Henry Comstock Memorial Lecture:**
The Challenge of Insecticide Resistance.
A. W. A. BROWN, Department of Zoology, The University of Western Ontario London, Canada.

11:00 a.m. **Preliminary Business Meeting of the Society.**
President: M. P. JONES, presiding.

12:00 Noon **NOON RECESS**

1:30–1:54 p.m. **Preliminary Sectional Business Meetings.**

Section A. *General Entomology*
Garden Room. A. B. GURNEY, *Chairman*

Section B. *Physiology and Toxicology*
Vernon Room. F. W. FISK, *Chairman*

Section C. *Insect Biology*
Viking Theater. G. H. KALOOSTIAN, *Chairman*

Section D. *Medical and Veterinary Entomology*
Mandarin Room. CARROLL N. SMITH, *Chairman*

Section E. *Control, Extension, and Regulatory Entomology*
Solarium. E. P. REAGAN, *Chairman*

Section F. *Chemical Control*
Rutland Room. R. J. NORTON, *Chairman.*

	A. General Entomology Garden Room	B. Physio. & Toxicol. Chairman: F. W. Fisk Vernon Room	C-b. Apiculture Tower Room	C-c. Ins. Vctrs. Plt. Dis. West Room
1:54	**Symposium:** Recent Advances in the Study of Fossil Insects. *Moderator:* **Ray F. Smith, Univ. of Calif., Berkeley.**	**14.** The Effects of Blood Abnormalities on the Normal Physiological Response of Insects. **R. L. Patton, Dept. of Ent., Cornell Univ., Ithaca, N. Y.**	**Symposium:** Female Dimorphism and Colony Organization in Social Hymenoptera. Part I. **Co-sponsored by Int. Union for Study of Social Insects and the Bee Research Assoc.** *Moderator:* **T. S. K. Johansson, Biol. Dept., Queens College, Flushing, N. Y.**	**Joint Symposium, Sections C & D, and Subsections C-c and C-d.** Biological Transmission of Disease Agents. Part I. Plant Disease Agents. *Moderator:* **Karl Maramorosch, Rockefeller Inst. for Medical Research, New York City**
2:06		**15.** Tracheal Histolysis in the Pupae of Diptera. **Joan M. Whitten, Dept. of Biol. Sciences, Northwestern Univ., Evanston, Ill.**		
2:18	Recent Advances in our Knowledge of Palaeozoic Insects. **Frank M. Carpenter, Harvard Univ., Cambridge, Mass.**	**16.** The Effect of Maxillectomy on Food-Plant Selection by the Larvae of *Protoparce sexta* (Johan.) (Lepidoptera, Sphingidae). **G. P. Waldbauer and G. S. Fraenkel, Univ. of Ill., Urbana.**	Communication of Social Bees as Related to Colony Organizations. **R. Boch, CDA, Ottawa, Canada.**	The Mechanism of Aphid-borne Viruses. **E. S. Sylvester, Univ. of Calif., Berkeley.**
2:30		**17.** The Utilization of Solanaceous and Non-Solanaceous Plants by the Larvae of *Protoparce sexta* (Johan.), (Lepidoptera, Sphingidae). **G. P. Waldbauer and G. S. Fraenkel, Univ. of Ill., Urbana.**	X-ray and Radioactive Materials as Techniques in Studying Social Organization in Honey Bee Colonies. **W. R. Lee, Dept. of Ent., Univ. of N. H., Durham**	Recent studies on the morphology and serology of leafhopper-borne viruses with biological cycles. **L. M. Black, Univ. of Ill., Urbana.**
2:42	Silicified Miocene Insects from the Mojave Desert, California. **Allison R. Palmer, U. S. Geological Survey, Washington, D. C.**	**18.** Observations on Bloodfeeding Behavior of Mosquitoes. **Paul A. Woke, National Institutes of Health, Bethesda, Md.**		
2:54		**19.** Oviposition Behavior of the Cockroach *Eurycotis floridana* (Walker). **F. A. McKittrick and T. Eisner, Cornell Univ., Ithaca, N. Y.**	Division of Labor in Ants. **W. L. Brown, Jr., Museum of Comparative Zoology, Harvard Univ., Cambridge, Mass.**	Present status of thrips-borne viruses. **K. Sakimura, Pineapple Research Institute, Honolulu.**

E. Cont., Ext., & Reg. Ent. Solarium	F. Chemical Control Rutland Room
Panel Discussion: Entomological Contributions to Human Welfare. *Moderator*: **Ordway Starnes, Agr. Exp. Sta., Rutgers Univ., New Brunswick, N. J.**	**Symposium:** Insecticides Contribute to Human Welfare. *Moderator*: **George C. Decker, Ill. Nat. History Survey, Urbana.**
Extension. **Gerald H. Huffman, Assistant Administrator, Federal Extension Service, Washington, D. C.**	Contributions of Insecticides to Public Health. **Mitchell R. Zavon, Kettering Institute of Industrial Hygiene, Univ. of Cincinnati, Cincinnati.**
Plant Pest Control. **E. D. Burgess, Director, Plant Pest Control Div., ARS, USDA, Washington, D. C.**	Contributions of Insecticides to American Home Life, Including Nutrition and Household Pests. **Dr. Hazel K. Stiebeling, Director, Institute of Home Economics, ARS, USDA, Washington, D. C.**
RECESS	

	A. General Entomology Garden Room Symposium continued	B. Physio. & Toxicol. Chairman: F. W. Fisk Vernon Room	C-b. Apiculture Tower Room Symposium continued	C-c. Ins. Vetrs. Plt. Dis. West Room Joint Symposium cont'd.
3:06		**20.** Cholinesterase in the Two-Spotted Spider Mite. **William D. McEnroe, Cornell Univ., Ithaca, N. Y.**	**W. L. Brown, Continued**	**K. Sakimura, Continued**
3:18	The Present Status of Studies Dealing with Insects Preserved in Amber from Mexico and Alaska. **Paul D. Hurd, Jr., Univ. of Calif., Berkeley.**	**RECESS**	**RECESS**	**RECESS**
3:30	Recent Discoveries of Insect-bearing Amber in the Dominican Republic. **Milton W. Sanderson, Ill. Nat. History Survey, Urbana.**	**21.** Histochemical Studies on the Identification and Localization of Esterases in Insect Eggs. **E. Helen Salkeld, N. Y. St. Agr. Exp. Sta., Geneva.**	Production of Young Queens and the Question of Colony Division in Legionary Ants. **T. C. Schneirla, Dept. of Animal Behavior, Amer. Museum of Nat. History, New York, N. Y.** ***Followed by Discussion***	Mite-borne plant viruses. **L. S. Jones, ERD, ARS, USDA, Riverside, Calif.**
3:42		**22.** Location and Histology of the Contact Chemoreceptors of *Stomoxys calcitrans* L. **Jean R. Adams, Dept. of Ent., Rutgers Univ., New Brunswick, N. J.**		
3:54	**Discussion**	**23.** Stages in the Sclerotization of Cuticle. **A. Glenn Richards, Univ. of Minn., St. Paul.**		
4:06	**1.** The Black-Bordered Species of *Myzocallis* of Oaks (Homoptera, Aphidae). **H. Bruce Boudreaux, Dept. of Zool., La. St. Univ., Baton Rouge, and A. N. Tissot, Dept. of Ent., Univ. of Fla., Gainesville.**	**24.** Origin of the Ventral Diaphragm of a Moth. **A. Glenn Richards, Univ. of Minn., St. Paul.**		The Role of Nematodes in the Transmission of Plant Viruses. **W. B. Hewitt, Univ. of Calif., Davis.**

MONDAY, P.M., NOVEMBER 28

E. Cont., Ext., & Reg. Ent. Solarium Panel Discussion Cont'd.	F. Chemical Control Rutland Room Symposium continued
	Dr. Hazel K. Stiebeling, Continued
Plant Quarantine. **Horace S. Dean, Assistant Director, Plant Quarantine Division, ARS, USDA, Washington, D. C.**	
	RECESS
Public Health. **John W. Hughes, Assistant Chief for Entomology, Foreign Quarantines Division, U. S. Public Health Service, Washington, D. C.**	
	Contributions of Insecticides to Armed Services and National Defense. **Capt. Richard T. Holway, USN, Executive Secretary, Armed Forces Pest Control Board, WRAMC, Washington, D. C.**
State Viewpoint. **Robert W. Harper, Chief, Bureau of Entomology, State Department of Agriculture, Sacramento, California.**	

"I found a shop supplied by a farmer who doesn't use any chemical sprays!"

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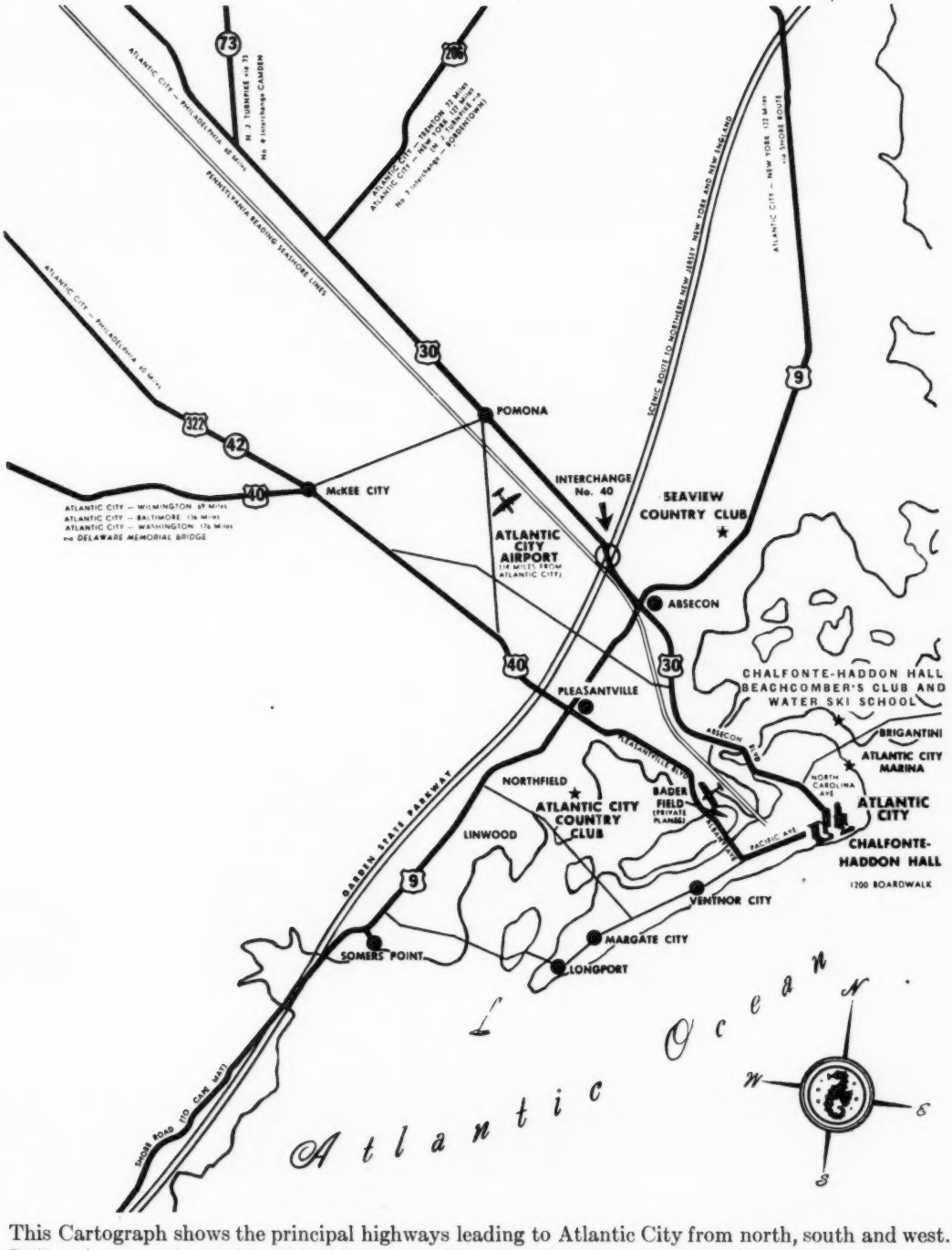
		B. Physio. & Toxicol. Chairman: F. W. Fisk Vernon Room	C-a. Biological Control Chairman: J. D. Briggs Tower Room	E. Cont., Ext., & Reg. Ent.—Solarium Panel Discussion Cont'd.
4:18		**25.** Electron Microscopy of the Chemosensory Hairs of the Blowfly *Phormia regina*. **Joseph R. Larsen, Jr., Univ. of Penn., Philadelphia.**	**73.** Studies on the Morphology and Life History of a Nematode Parasite (Mermithidae) of the Alfalfa Weevil (*Hypera postica* (Gyll.)). **George O. Poinar, Jr. and George G. Gyrisco, Dept. of Ent., Cornell Univ., Ithaca, N. Y.**	**Discussion**
4:30		**26.** Studies on the Humoral Response of *Oncopeltus fasciatus* (Dallas) to Injected Antigens. **Richard E. Gingrich, Ohio St. Univ., Columbus.**	**74.** *Parasitaphelenchus oldhami* Rühm, a nematode parasite of *Scolytus multistriatus* (Marsh.). **Joseph L. Saunders and Dale M. Norris, Jr., Dept. of Ent., Univ. of Wis., Madison.**	
4:42		**27.** Studies on the Chemistry of Praying Mantids (*Paratenodera sinensis*) egg glue. **B. R. Wilson and Maryellen Marrow, Dept. of Ent., Rutgers University, New Brunswick, N. J.**	**75.** Parasites and Predators of the Introduced Pine Sawfly, *Diprion similis* (Htg.) in Wisconsin. **Harry C. Coppel, Dept. of Ent., Univ. of Wis., Madison.**	
4:54		**28.** Lipids of House Flies. **Roy J. Barker, Leland N. Edmunds, Jr., and Charles F. Cohen, ERD, ARS, USDA, Beltsville, Md.**	**76.** Serological Studies of Spider Predation on the Spruce Budworm. **B. Loughton and A. S. West, Dept. of Biology, Queens University, Kingston, Ont., Canada.**	
5:06		**29.** The Hydrocarbons of Adult House Flies. **Spiro J. Louloudes, Donald B. Moyer, and James H. Starkey III, ERD, ARS, USDA, Beltsville, Md.**	**77.** *Mesoleius tenthredinis* Mor. in Pennsylvania and Upper Michigan. **A. T. Drooz, Southeastern Forest Experiment Station, Asheville, N. C.**	
5:18	**DINNER RECESS**			
6:30	**MIXER (or Greek *Symposium), Carolina Room, Chalfonte Hotel, Lounge Floor** ***Symposium** (sim po' zi um), *n.* (among the ancient Greeks) a convivial meeting, usually following a dinner, for drinking, conversation, and *intellectual* entertainment.			
8:00	**PHOTO SALON, Vernon Room** Motion Pictures and Slides			



This Cartograph shows the principal highways leading to Atlantic City from north, south and west. Railroad connections with Philadelphia and New York by the way of the Pennsylvania-Reading Seashore Lines are sketched.

TUESDAY, A.M., NOVEMBER 29

	A. General Entomology Chairman: A. B. Gurney Garden Room	B. Physio. & Toxicol. Vernon Room	C-b. Apiculture Tower Room	Heliothis Conference West Room
9:00		**Joint session with Biometric Society, ENAR.** Some Biometrical Methods in Entomological Investigations. **Chairmen: T. A. Bancroft and F. W. Fisk.**	**Symposium:** Female Dimorphism and Colony Organization in Social Hymenoptera. Part II. **Cosponsored by Int. Union for Study of Social Insects and the Bee Research Assoc.** *Moderator:* **R. A. Morse, Dept. of Ent., Cornell Univ., Ithaca, N. Y.**	**9:00–12:00** *Moderator:* **Clyde F. Smith, N. C. St. Col., Raleigh.** *No papers.* Research workers reporting on their work during 1960 and discussing future plans. ***Informal.***
9:12	**Invitational Address** The Aesthetic Value of Entomology. **Melville H. Hatch, Univ. of Wash., Seattle.**			
9:24		Some Aspects of Bioassays of Minute Insecticidal Residues. **John Gurland and Paul A. Dahm, Iowa St. Univ., Ames.**	Genetics and Behavior of Honey Bee Colonies. **W. C. Rothenbuhler, Dept. of Ent., Iowa St. Col., Ames.**	
9:36	**Invitational Address** The New International Code of Zoological Nomenclature. **Curtis W. Sabrosky, ERD, ARS, USDA, Washington, D. C.**			
9:48	**Discussion**	The Estimation of Threshold Stimuli in Insects. **C. I. Bliss, Conn. Agr. Exp. Sta., New Haven.**	The Laying Worker in the Cape Honey Bee (*Apis mellifera capensis*). **R. H. Anderson, S. E. College of Agr., Univ. of Stellenbosch, Union of So. Africa (Present address: Dept. of Ent., Cornell Univ., Ithaca, N. Y.)**	
10:00	2. Depositories of New World Odonata Type Specimens. **B. Elwood Montgomery, Dept. of Ent., Agri. Exp. Sta., Purdue University, Lafayette, Ind.**	A Statistical Study of Parathion and DDT Residues on Apples. **Richard J. Daum, ARS, USDA, Beltsville, Md.**	Early Respiratory Studies in Female Dimorphism in the Honey Bee. **S. E. Dixon and R. W. Shuel, Dept. of Api., Ontario Agr. Col., Guelph, Ontario, Canada.**	

C-d. Ecology & Bionomics Chairman: G. G. Gyrisco Viking Theater	D. Med. & Vet. Ent. Mandarin Room	E-a. Extension Solarium	F. Chemical Control Chairman: R. J. Norton Rutland Room
Invitational Address: Factors Influencing Population Density of Plant-Feeding Mites. **Charles A. Fleschner, Citrus Exp. Sta., Dept. of Biol. Control, Univ. of Calif., Riverside.**	**Panel Discussion:** The Biology and Control of the Face Fly, *Musca autumnalis* De Geer. **Panel Chairman: E. C. Turner, Jr., Dept. of Ent., Va. Agr. Exp. Sta., Blacksburg.**	**Symposium I:** Evaluating Past and Present Extension Programs to Plan for the Future. *Moderator*: **L. E. Adams, Pa. State Univ., University Park.**	**168.** Control of the Lesser Peach Tree Borer in Virginia. **Marvin L. Bobb, Va. Agr. Exp. Sta., Piedmont Fruit Research Lab., Charlottesville.**
	Observations on Behavior and Ecology in Canada. **H. J. Teskey, Ent. Lab., Res. Br., CDA, Guelph, Ontario.**	Insect Photography. **Ray Kriner, Greencastle, Pa.**	**169.** Germination of Seeds After Fumigation. **R. G. Strong and D. L. Lindgren, Univ. of Calif., Citrus Exp. Sta., Riverside.**
	Laboratory and Field Studies in Ohio. **R. E. Treece, Dept. of Ent., Ohio Agr. Exp. Sta., Wooster.**		**170.** Preliminary Notes on Some Mites of Economic Importance in Various Crops and on Their Control in Central Venezuela. **Ernesto Doreste S., Servicio Shell Para El Agricultor, Cagua—Estado Aragua, Venezuela.**
	Experiments on Face Fly Control for Dairy Cattle in New York. **P. E. Ode and J. G. Matthysee, Dept. of Ent., Cornell Univ., Ithaca, N. Y.**	How Have Extension Entomologists Contributed to Human Welfare in Pennsylvania? **J. O. Pepper, Pa. St. Univ., University Park.**	**171.** Delaying the Selection of Acaricide Resistant Strains of Mites. **Dean Asquith, Pa. St. Univ. Res. Lab., Arendtsville.**
INSECT GENETICS SESSION **Chairman: W. C. Rothenbuhler** **Viking Theater**	Control of *Musca autumnalis* De Geer in Illinois. **W. N. Bruce, Ill. Nat. Hist. Survey, Urbana, Ill.**		**172.** Recent Developments in the Insecticidal Control of the Apple Maggot. **R. W. Dean, N. Y. State Agr. Exp. Sta., Poughkeepsie.**
103. Inheritance of DDT Resistance in the German Cockroach. **Donald G. Cochran, Dept. of Ent., Virginia Agr. Expt. Sta., Blacksburg.**	History and Present Distribution in North America. **C. W. Sabrosky, ERD, ARS, USDA, Washington, D. C.**	Using Insecticides on Food Crops, and Residue Problems. **George D. Jones, N. C. St. Col., Raleigh.**	**173.** Observations and Control of Cyclamen Mite on Strawberries. **G. A. Schaefers, N. Y. St. Agr. Exp. Sta., Geneva.**

TUESDAY, A.M., NOVEMBER 29

	A. General Entomology Chairman: A. B. Gurney Garden Room	B. Physio. & Toxicol. Vernon Room Joint Session continued	C-b. Apiculture Tower Room Symposium continued	Heliothis Conference West Room
10:12	RECESS	Richard J. Daum, Continued	S. E. Dixon and R. W. Shuel, Continued	Heliothis Conference, Continued
10:24	3. Taxonomy of the *Nigricornis* group of *Oecanthus* (Orthoptera, Gryllidae). **T. J. Walker, Jr., Dept. of Ent., Univ. of Fla., Gainesville.**	RECESS	RECESS	RECESS
10:36	4. Further Advances in the Taxonomy and Distribution of the Grylloblattidae (Orthoptera). **Ashley B. Gurney, ERD, ARS, USDA, Washington, D. C.**	Factors Affecting Precision in European Corn Borer Investigations. **D. V. Sisson,[1] T. A. Brindley,[2] and T. A. Bancroft,[2]** **[1]ARS, USDA, Beltsville, Md., and** **[2]Iowa State Univ., Ames, Iowa.**	The Relationship Between Colony Organization and the Queen Honey Bee. **N. Gary, Dept. of Ent., Cornell Univ., Ithaca, N. Y.**	Heliothis Conference, Continued
10:48	5. The Male Genitalia and Terminal Segments of Some Members of the Genus *Polyergus* (Formicidae: Hymenoptera). **James Forbes and Roger W. Brassel, Biological Laboratory, Fordham Univ., New York, N. Y.**			
11:00	6. Morphological Studies on the Head Capsule of Larval Neuroptera. **Ellis G. MacLeod, Dept. of Zool., Univ. of Md., College Park.**	**Discussant:** **F. M. Wadley, Arlington, Va.**	Experimental Feeding and Female Dimorphism in the Honey Bee. **M. V. Smith, Dept. of Apiculture, Ontario Agr. Col., Guelph, Ontario, Canada.**	
11:12	7. The Comparative External Morphology of *Trichobius corynorhini* Cockerell, *T. major* Coquillett, and *T. sphaeronotus* Jobling (Diptera, Streblidae). **Part I. The Head.** **V. H. Zeve and D. E. Howell, Dept. of Ent., Okla. St. Univ., Stillwater.**		*Followed by Discussion*	

TUESDAY, A.M., NOVEMBER 29

Insect Genetics Session Ch.: W. C. Rothenbuhler Viking Theater	D. Med. & Vet. Ent. Mandarin Room Panel Discussion Cont'd.	E-a. Extension Solarium Symposium continued	F. Chemical Control Chairman: R. J. Norton Rutland Room
104. Genetics of DDT—Resistance in Several Strains of *Aedes aegypti*. **A. W. A. Brown, Univ. of Western Ontario, London, Canada.**	**RECESS**	**George D. Jones, Continued**	**174.** Potentiating Action of Salicylates on the Action of Antifolics on *Drosophila melanogaster*. **H. E. Osburg and E. D. Goldsmith, Graduate School of Arts & Sciences & the College of Dentistry, N. Y. Univ., New York.**
105. Preliminary Maps of Polytene Chromosomes in *Aedes aegypti*. **Sister Alma Louise Mescher, Dept. of Biology, Notre Dame Univ., Notre Dame, Ind.**	Observations on Biology and Control in Virginia. **E. C. Turner, Jr., Dept. of Ent., Va. Agr. Exp. Sta., Blacksburg.**		**RECESS**
106. Heterozygosity in *Aedes aegypti* (L.). **Robert C. VandeHey, Dept. of Biology, Notre Dame Univ., Notre Dame, Ind.**	**Panel Discussion:** *Moderator*: **E. C. Turner, Jr.** **Panel Members:** **C. W. Sabrosky** **H. J. Teskey** **R. E. Treece** **J. G. Matthysee** **W. N. Bruce**	The Extension Entomologist—A Public Relations Agent. **J. O. Rowell, V. P. I., Blacksburg, Va.**	**175.** The Effect of Sevin-Synergist Combinations on the Cabbage Looper. **H. H. Shorey, Dept. of Ent., Univ. of Calif., Citrus Experiment Sta., Riverside.**
107. An Inherited Male-Producing Factor in *Aedes aegypti* (L.). **G. B. Craig, Jr., W. A. Hickey, and R. C. VandeHey, Dept. of Biology, Notre Dame Univ., Notre Dame, Ind.**			**176.** Continuous Fumigation with Hydrogen Cyanide of Sacked Milled Rice under Plastic Film. **Elvin W. Tilton, USDA, AMS, MQRD, Stored-Rice Insects Lab., Houston, Texas.**
108. Hybridization Barriers Between *Aedes aegypti* and *A. albopictus*. **Sister Mary Gerald Leahy, Univ. of Notre Dame, Notre Dame, Ind.**			**177.** Insect Pests of Grain Sorghum and Their Control. **Dan F. Clower, Dept. of Ent., La. St. Univ., Baton Rouge.**
109. The Natural Regulation of Populations by a Genetic Feed-Back Mechanism. **D. Pimentel, Dept. of Ent., Cornell Univ., Ithaca, N. Y.** *Followed by Discussion*		The Effective Use of Insect Newsletters. **W. C. Nettles, Clemson Agr. Col., Clemson, S. C.**	**178.** Alfalfa Weevil Control. **W. V. Campbell and T. G. Bowery, N. C. St. Col., Raleigh.**

TUESDAY, A.M., NOVEMBER 29

	B. Physio. & Toxicol. Chairman: F. W. Fisk Vernon Room	D. Med. & Vet. Ent. Chairman: C. N. Smith Mandarin Room	E-a. Extension Solarium Symposium continued	F. Chemical Control Chairman: R. J. Norton Rutland Room
11:24	**30.** Metabolism of N,N-Dialkyl Carbamate Insecticides and Related Compounds. **Ernest Hodgson and John E. Casida, Dept. of Ent., Univ. of Wisc., Madison.**	**145.** Host Associations of Siphonaptera and Cricetid Rodents in the Midwest. **Cluff E. Hopla, Univ. of Okla., Norman.**	**Panel:** Techniques Used in Training County Agents. **H. B. Petty, Univ. of Ill. Urbana, and A. A. Muka, Cornell Univ., Ithaca, N. Y.**	**179.** Influence of the Clover Root Borer on the Longevity and Hay Yield of Red Clover. **C. S. Koehler and George G. Gyrisco, Cornell Univ., Ithaca, N. Y.**
11:45	**NOON RECESS**			

TUESDAY, P.M., NOVEMBER 29

1:15–2:20 PLENARY ADDRESSES. Vernon Room

Food Additives and Public Health.

J. G. HARRAR, *Vice President*, The Rockefeller Foundation, Member of the Panel on Food Additives of the President's Science Advisory Committee, New York City.

The Contributions of Insect Physiology and Toxicology to Human Welfare.

ALBERT S. PERRY, CDC, USPHS, HEW, Savannah, Ga. (Sponsored by Section B)

RECESS

2:30–5:00 JOINT SYMPOSIUM: Biological Transmission of Disease Agents. Sections C, C-c, C-d, & D Cooperating. Arranged by Section D.

Part II. Agents of Human and Animal Diseases.

Moderator: W. C. MCDUFFIE, ERD, ARS, USDA, Beltsville, Md.

The Role of Nematodes and Trematodes as Carriers of Disease Agents of Man and Animals.

C. B. Philip, Rocky Mountain Laboratory, USPHS, Hamilton, Montana.

Mites and Ticks as Disease Vectors.

ROBERT TRAUB, U. S. Army Medical Research and Development Command, Washington, D. C.

Ticks as Virus Vectors in Eastern Europe.

DIOMYZ BLASCOVIC, Institute of Virology, Bratislava, Czechoslavakia.

Control of Insect Vectors of Disease.

A. W. LINDQUIST, ERD, ARS, USDA, Beltsville, Md.

RECESS

Recent Advances in the Study of Tsetse Fly-Borne Diseases.

KENNETH C. WILLETT, West African Institute, Kaduna, Nigeria.

Mosquitoes and Virus Diseases.

WM. C. REEVES, Univ. of Calif., School of Public Health, Berkeley, Calif.

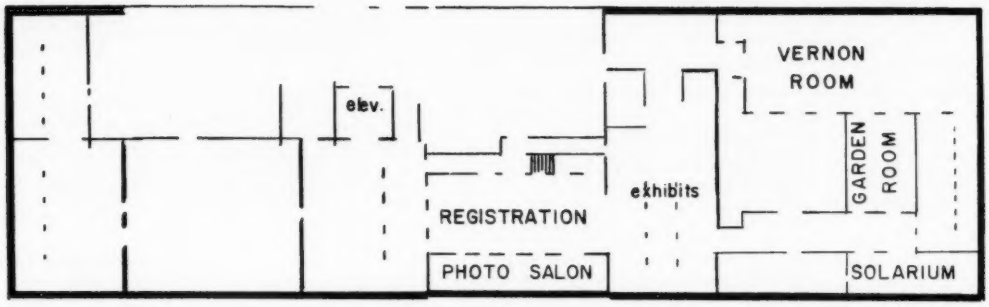
Sand Flies and Disease.

HERBERT C. BARNETT, Walter Reed Institute of Research, Walter Reed Army Medical Center, Washington D. C.

Tabanids as Disease Vectors.

DARIEL E. HOWELL, Dept. of Entomology, Oklahoma State Univ., Stillwater.

6:30 **BANQUET—Vernon Room**



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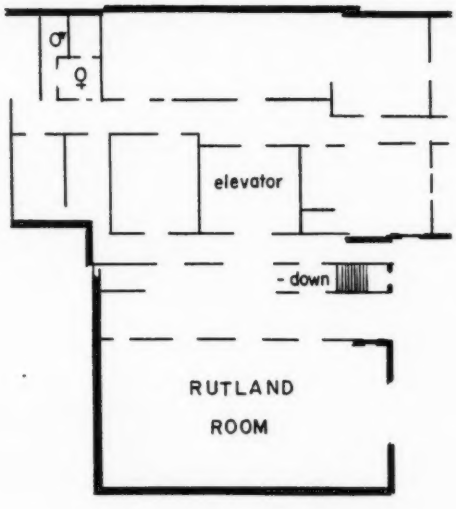
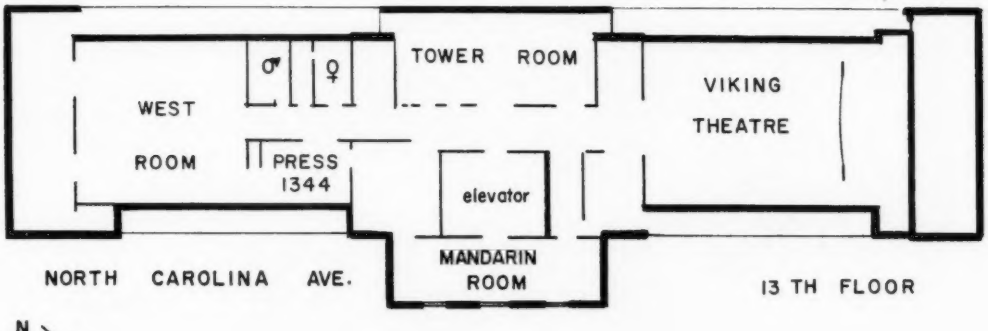


UPPER LOUNGE



NORTH CAROLINA AVE.

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WEDNESDAY, A.M., NOVEMBER 30

	A. General Entomology Garden Room	A-b. Teaching Rutland Room	B. Physio. & Toxicol. Chairman: F. W. Fisk Vernon Room	C-a. Biological Control Chairman: J. D. Briggs Tower Room
9:00	**Symposium:** Some Basic Aspects of Systematic Categories, Mainly Those Above the Species Level. *Moderator:* **Charles D. Michener, Univ. of Kan., Lawrence.**	**Symposium:** The Organization and Teaching of Entomology. *Moderator:* **A. C. Cole, Jr., Univ. of Tenn., Knoxville.**	**31.** The Composition of RNA in the Developing House Fly Ovary. **Norman Mitlin and Charles F. Cohen, Ent. Res. Div., ARS, USDA, Beltsville, Md.**	
9:12	Utilitarian Aspects of Ordinal and Family Names. **Reese I. Sailer, ERD, ARS, USDA, Beltsville, Md.**	The Place of Physiology in Entomological Curricula. **A. G. Richards, Univ. of Minn., St. Paul.**	**32.** Hyaluronidase and its Function in the American Cockroach, *Periplaneta americana* (L.). **Donald J. Sutherland, Rutgers University, New Brunswick, N. J.**	**Invitational Address** **9:00–10:00** Biological Control of Weeds. **James K. Holloway, ERD, ARS, USDA, Albany, Calif.**
9:24	Current Tendencies to Increase the Number of Higher Taxonomic Categories Among Insects. **D. Keith McE. Kevan, MacDonald College, Quebec, Canada.**		**33.** Adenine Nucleotides in the Thoracic Flight Muscle of the House Fly, *Musca domestica* L. **Morris Rockstein and Donald Gutfreund, School of Medicine, New York University, New York.**	
9:36			**34.** Experiments Concerning the Effects of Mating on Longevity in *Aedes aegypti* (L.). **James N. Liles, Univ. of Tennessee, Knoxville.**	
9:48	Methods and Principles Used in Studying Higher Categories of the Ephemeroptera. **George F. Edmunds, Jr., Univ. of Utah, Salt Lake City.**	Education vs. Training for Entomology Students. **J. K. Reed, Clemson College, Clemson, S. C.**	**35.** Physiological Comparisons of Offspring of *Tenebrio molitor* from Young and Old Parents. **Carl Fiore and Daniel Ludwig, Biological Lab., Fordham Univ., New York, N. Y.**	
10:00			**36.** Effects of Parental Age in *Tenebrio molitor* in Offspring Obtained from Isolated Pairs. **Daniel Ludwig and Carl Fiore, Biological Lab., Fordham Univ., New York, N. Y.**	**RECESS**

C-c. Ins. Vctrs. Plt. Dis. Chairman: J. N. Simons West Room	C-d. Ecology & Bionomics Chairman: G. G. Gyrisco Viking Theater	D. Med. & Vet. Ent. Chairman: C. N. Smith Mandarin Room	E-b. PPC & Quar. Chairman: J. J. Favinger Solarium
97. Plant-Vector-Virus Relationships of the Treehopper Transmitted Pseudo-Curly Top Virus in Florida. **John N. Simons, Stanford Res. Inst., So. Pasadena, Calif.**	**111.** Behavior of Some Southwestern Lycids and Their Mimics. **E. Gorton Linsley, Dept. of Ent. & Paras., University of Calif., Berkeley.**	**Invitational Address:** Highlights in Medical and Veterinary Entomology During 1960. **K. D. Quarterman, Communicable Disease Center, USPHS, Savannah, Ga.**	**Symposium:** Contributions of Pest Control Programs to Agricultural Economy. *Moderator*: **John J. Favinger, State Entomologist, Indianapolis, Ind.** How Pest Control Programs are Necessary to the Agricultural Economy. **Frank A. Soraci, Director, Div. of Plant Industry, State Department of Agriculture, Trenton, N. J.**
98. Effect of Insect-Feeding Upon the Susceptibility of *Physalis floridana* to Potato Leafroll Virus Infection by *Myzus persicae* (Sulz.). **O. S. Bindra, Dept. of Ent., Univ. of California, Berkeley.**	**112.** Further Investigations On Sex-ratio and Fertilization in Spider Mites. **H. Bruce Boudreaux, Louisiana State University, Dept. of Zoology, Baton Rouge.**		
99. Influence of Numbers of *Myzus persicae* (Sulz.) in the Transmission of Potato Leafroll Virus. **O. S. Bindra, Dept. of Ent., Univ. of California, Berkeley.**	**113.** The Effect of Plant Nutrition On the Reproductive Rate of Two Strains of the Two-Spotted Spider Mite. **T. J. Henneberry and Floyd F. Smith, ERD, ARS, USDA, Beltsville, Md.**	**146.** Entomological Aspects of the 1959 Outbreak of Eastern Encephalitis in New Jersey. **R. O. Hayes, L. D. Beadle, L. C. LaMotte, A. D. Hess, O. Sussman, and M. J. Bonese, Technology Branch, C.D.C., U. S. Public Health Service, Greeley, Colo.**	The Need for a Strong Plant Quarantine Program. **G. F. Callaghan, Plant Quarantine Division, ARS, Washington, D. C.**
100. The Effect of Flight of the Green Peach Aphid on Transmission of Lettuce Mosaic Virus. **Donald L. McLean, Univ. of California, Davis.**	**114.** Some Mating Habits of Two-Spotted Spider Mites and Hybridization Between Two Species. **A. L. Boswell and Floyd F. Smith, ERD., ARS, USDA, Beltsville, Md.**	**147.** Insecticide-Resistance in Certain Mosquito Species of Texas. **Don W. Micks, Lab. of Med. Ent., Univ. of Texas Med. Branch, Galveston.**	
101. Annual Incidence of Spread of Phony Peach Disease Virus Broken by Environmental Sprays. **George H. Kaloostian, USDA, ARS, Ent. Res. Div., Fort Valley, Ga.**	**115.** Life History of *Halictus ligatus* Say (Hymenoptera, Halictidae). **Leland Chandler, Dept. of Ent., Purdue Univ., Lafayette, Ind.**	**148.** Effects of Impounding and Filling on the Distribution of Culicoides Larvae in Florida Salt Marshes. **Andrew J. Rogers, Entomological Research Center, State Board of Health, Vero Beach, Fla.**	The Need for Pest Detection Follow-ups. **Louis G. Davis, Plant Pest Control Division, ARS, Washington, D. C.**
	116. Diapause in the Sugarcane Borer. **K. P. Katiyar and W. H. Long, Ent. Res. Dept., Louisiana State Univ., Baton Rouge.**	**149.** Sex Determination in *Aedes aegypti* (L.) **J. E. Tullis and D. M. DeLong, Ohio State University, Dept. of Zoology, Columbus.**	

WEDNESDAY, A.M., NOVEMBER 30

	A. General Entomology Garden Room Symposium continued	A-b. Teaching Rutland Room Symposium continued	B. Physio. & Toxicol. Chairman: F. W. Fisk Vernon Room	C-a. Biological Control Chairman: J. D. Briggs Tower Room
10:12	**RECESS**	**RECESS**	**37.** Amino Acid Incorporation into Proteins of Subcellular Fractions from the Silk Gland of *Bombyx mori*. **John J. Corrigan and Alton Meister, Dept. of Biochemistry, Tufts Univ. Medical School, Boston, Mass.**	**78.** Increased Resistance to a Wasp Parasite in the House Fly. **Rafi Al-Hafidh and David Pimentel, Dept. of Entomology, Cornell Univ., Ithaca, N. Y.**
10:24	Functions and Limitations of Supraspecific Categories in Systematics. **Charles D. Michener, University of Kansas, Lawrence.**	A Perspective of the Undergraduate Entomology Curriculum. **W. E. Bickley, Univ. of Maryland, College Park.**	**38.** The Fate of Dietary H^3-β-Sitosterol in the Adult House Fly. **J. N. Kaplanis, R. E. Monroe, W. E. Robbins, and Spiro J. Louloudes, Ent. Res. Div., ARS, USDA, Beltsville, Md.**	**79.** A Self-sustaining Host-Parasite System for Laboratory Studies. **W. P. Nagel and David Pimentel, Dept. of Entomology, Cornell Univ., Ithaca, N. Y.**
10.36			**39.** The Metabolism of H^3-β-Sitosterol by Nymphal German Cockroaches. **W. E. Robbins R. C. Dutky, R. E. Monroe, and J. N. Kaplanis, Ent. Res. Div. ARS, USDA, Beltsville, Md.**	**80.** A Study of the Dispersal habits of *Trichogramma fasciatum* Perkins Using Radio-Active P^{32}. **Vernon M. Stern and Evert I. Schlinger, Dept. of Entomology, Citrus Exp. Sta., Univ. of California, Riverside.**
10:48	Higher Categories and Phylogeny. **R. S. Bigelow, MacDonald College, Quebec, Canada.**		**40.** Cholesterol and β-Sitosterol in the Larval Medium and Their Effect on Sterol Storage and Reproduction in the House Fly. **R. E. Monroe, J. N. Kaplanis and W. E. Robbins, Ent. Res. Div., ARS, USDA, Beltsville, Md.**	**81.** Resistance in Beans (*Phaseolus* spp.) to the Potato Leafhopper (*Empoasca fabae* (Harr.)) and the Mexican Bean Beetle (*Epilachna varivestis* Mulsant). **Dan Wolfenbarger and J. P. Sleesman, Dept. Entomology, Ohio Agr. Expt. Sta., Wooster.**
11:00			**41.** Carbohydrate Metabolism in the Two-Spotted Mite (*Tetranychus telarius*). **K. N. Mehrotra, Cornell University, Ithaca, N. Y.**	**82.** Plant Resistance to Insects in Cole Crops. **D. Pimentel, Dept. of Entomology, Cornell Univ., Ithaca, N. Y.**
11:12	**Discussion**	**Discussion**	**42.** Chloride Requirement in Cockroach Nutrition. **Marion A. Brooks, Dept. of Ent. & Zool., Univ. of Minnesota, St. Paul.**	**83.** The Use of Test Crosses in Breeding Corn for Resistance to the European Corn Borer. **W. D. Guthrie and G. H. Stringfield, Ent. Res. Div., ARS, USDA, and Crops Res. Div., ARS, USDA, Ohio Agr. Exp. Sta., Wooster.**

C-d. Ecology & Bionomics Chairman: G. G. Gyrisco Viking Theater	D. Med. & Vet. Ent. Chairman: C. N. Smith Mandarin Room	E-b. PPC & Quar. Chairman: J. J. Favinger Solarium
117. Notes on the Biology of *Orasema costaricensis* Wheeler & Wheeler. **Charles D. LeSar, Cia. Bananera de Costa Rica (United Fruit Company), Palmar Research Station Palmar, Costa Rica.**	**150.** A Trap for Sampling Populations of Flying Bloodsucking Insects. **Robert F. Harwood, Dept. of Ent., Washington State Univ., Pullman.**	What Insect Pests or Plant Diseases are to be Considered for Eradication or Control Programs. **G. G. Rohwer, Plant Pest Control Div., ARS, Moorestown, N. J. and W. E. Blasingame, Director, Div. of Entomology, Georgia Dept. of Agriculture, Atlanta.**
118. Biology and Control of the Daylily Aphid, *Myzus hemerocallis* Takahashi. **T. L. Stringfellow and J. S. Roussel, Louisiana State University, Baton Rouge.**	**151.** Longevity of Organophosphorus Insecticides in Soil as Tested Against the Eye Gnat *Hippelates collusor*. **Mir S. Mulla, George P. Georghiou and Harry W. Cramer, Jr., Univ. of California, Citrus Experiment Sta., Riverside.**	
RECESS	**RECESS**	
119. Some Observations on the Ecology of the Western Harvester Ant, *Pogonomyrmex occidentalis* (Cresson). **S. R. Race, Dept. of Ent., New Mexico State University, University Park.**	**152.** The Effect of Additives on the Repellent Action of Pyrethrum. **R. H. Roberts and O. H. Graham, Ent. Res. Div., ARS, USDA, Kerrville, Texas.**	Essentials Necessary for a Control Program to be Considered Successful. **W. G. Cowperthwaite, State Plant Board, Gainesville, Fla.**
120. *Derobrachus brevicollis* Serv., A New Pest of Bahia Grass. **H. H. Tippins, L. W. Morgan, and C. M. Beckham, Georgia Experiment Station, Experiment.**	**153.** Studies with Three Alkylating Agents as House Fly Sterilants. **G. C. LaBrecque, J. B. Gahan, and C. R. Crittenden, Ent. Res. Div., ARS, USDA, Orlando, Fla.**	
121. A Technique for Continuous Rearing of the Red-Banded Leaf Roller *Argyrotaenia velutinana* (Wlkr.). **E. H. Glass and G. E. R. Hervey, New York State Agr. Exp. Sta., Geneva.**	**154.** Toxicity to House Fly Larvae of Droppings from Chicks Administered Insecticides in Feed or Water. **Martin Sherman and Ernest Ross, Univ. of Hawaii, Honolulu.**	

WEDNESDAY, A.M., NOVEMBER 30

	A. General Entomology Garden Room Symbosium continued	A-b Teaching Rutland Room Symposium Continued	B. Physio. & Toxicol. Chairman: F. W. Fisk Vernon Room	C-a. Biological Control Chairman: J. D. Briggs Tower Room
11:24	**Discussion, continued**	**Discussion, continued**	**43.** A New Approach in Control of the Boll Weevil. **J. R. Brazzel, T. B. Davich, and L. D. Harris, A. & M. College of Texas, Col. Station.**	**84.** The Persistence of Gypsy Moth Parasites in Heavily Sprayed Areas. **Philip B. Dowden, NE Forest Exp. Sta., Forest Insect Lab., New Haven, Conn.**
11:36	**FINAL SECTIONAL BUSINESS MEETINGS**			
	Same Room Assignments and Chairmen as for Preliminary Sectional Business Meetings			
12:00	**NOON RECESS**			

WEDNESDAY, P.M., NOVEMBER 30

	A. General Entomology Chairman: Lewis Berner Garden Room	B. Physio. & Toxicol. Chairman: F. W. Fisk Vernon Room	C-a. Biological Control Chairman: J. D. Briggs Tower Room
1:30	**Invitational Address:** Recent Progress and Needs in the Documentation of our Insect Fauna. **H. A. Denmark, Florida State Plant Board, Gainesville.**	**44.** Density of Granary Weevils in Relation to Insecticidal Effectiveness. **N. L. Halleppanavar, L. K. Cutkomp, and N. G. Patel, Dept. of Ent. & Ec. Zool., Univ. of Minnesota, St. Paul.**	**85.** The Infection of the Mosquitoes, *Psorophora howardii* Coq. and *Aedes taeniorhynchus* (Wied.) by the Fungus *Coelomomyces*. **Patrick T. M. Lum, Fla. St. Bd. of Health, Ent. Res. Cen., Vero Beach.**
1:42		**45.** The Levels of DDT-Dehydrochlorinase in All Stages of the Mexican Bean Beetle. **Averett S. Tombes, Dept. of Entomology, Rutgers Univ., New Brunswick, N. J.**	**86.** Preservation of Infectious Milky Disease Bacteria by Lyophilization. **Wm. C. Haynes, Grant St. Julian, Jr., Margaret C. Shekleton, and Harlow H. Hall, Northern Regional Res. Lab., Peoria, Ill., and H. Tashiro, Ent. Res. Div., ARS, Geneva, N. Y.**
1:54		**46.** Insecticide Problems In Communities. **D. Pimentel, Dept. of Entomology, Cornell Univ., Ithaca, N. Y.**	**87.** The Influence of Some Environmental Factors On the Virus-Wax Moth Association. **Martin Shapiro and David Pimentel, Dept. of Ent., Cornell Univ., Ithaca, N. Y.**
2:06	**Invitational Address:** Storage and Retrieval of Taxonomic Information. **William L. Brown, Jr., Cornell University, Ithaca, N. Y.**	**47.** Insecticidal Activity of 2-(2-Halogen-4-Chlorophenyl-2-(4-Chlorophenyl)-1,1,1-Trichloroethanes. **M. H. J. Weiden and H. H. Moorefield, Union Carbide Chemicals Co., Boyce Thompson Institute Plant Res., Yonkers, N. Y.**	**88.** A Preliminary Report on Rearing Techniques for *Tozorynchites r. septentrionalis* (D. & K.) with Notes on its Biology. **Robert E. Williams and D. M. DeLong. Dept. of Zool. & Ent., Ohio State Univ. Columbus.**

WEDNESDAY, A.M., NOVEMBER 30

C-d. Ecology & Bionomics Chairman: G. G. Gyrisco Viking Theater	D. Med. & Vet. Ent. Chairman: C. N. Smith Mandarin Room
122. Preferences of the Tarnished Plant Bug for Some of Its Host Plants. **Gudmund Taksdal and David Pimentel, Dept. of Entomology, Cornell Univ., Ithaca, N. Y.**	**155.** Field Evaluation of Organophosphorus Compounds for House Fly Control. **John W. Kilpatrick and H. F. Schoof, Technical Development Lab., C. D. C., Public Health Service, HEW, Savannah, Ga.**

FINAL SECTIONAL BUSINESS MEETINGS

Same Room Assignments and Chairmen as for Preliminary Sectional Business Meetings

NOON RECESS

WEDNESDAY, P.M., NOVEMBER 30

C-d. Ecology & Bionomics Chairman: G. G. Gyrisco Viking Theater	D. Med. & Vet. Ent. Chairman: C. N. Smith Mandarin Room	F. Chemical Control Chairman: R. J. Norton Rutland Room
123. Competition and the Species Per Genus Structure of Communities. **D. Pimentel, Dept. of Entomology, Cornell University, Ithaca, N. Y.**	**156.** Modifications of a Semiautomatic Liquid Poison Dispenser for House Fly Control. **John W. Kilpatrick and Darrell R. Maddock, Technical Development Lab., C.D.C., Public Health Service, USHEW, Savannah, Ga.**	**180.** A Projectile and Technique for Trunk Injection of Systemic Insecticides into Trees. **Dale M. Norris, Jr., Dept. of Ent., Univ. of Wisconsin, Madison.**
124. Host Relationships In Biotypes of the Pea Aphid, *Acyrthosiphon pisum* (Harris). **J. J. Cartier, Research Laboratory, St. Jean, Quebec, Canada.**	**157.** Horn Fly Control by the Pour-On Technique Using Ruelene or Toxaphene. **Wm. M. Rogoff and P. H. Kohler, Dept. of Ent. & Zool., South Dakota State College, Brookings.**	**181.** *Diprion similis* (Htg.) Control on White Pine with Systemic Phosphate Compounds. **Harry C. Coppel and Dale M. Norris, Jr., Dept. of Ent., Univ. of Wisconsin, Madison.**
125. Different Biological Reactions of the Diamond Back Moth and the Green Peach Aphid, to Plants Grown under Different Soil Fertility Conditions. **W. L. Freeman, Dept. of Entomology, Cornell Univ., Ithaca, N.Y.**	**158.** Observations on the Effects of Temperature and Humidity on Hornfly (*Siphona irritans* Fabricius) Behavior. **Neal O. Morgan, V.P.I., Blacksburg, Va.**	**182.** Control of Bark Beetles with Residual Sprays. **Robert L. Lyon, U. S. Forest Service, Berkeley, Calif.**
126. A Preliminary Survey of Insects, Losses and Insecticides Used in Home Gardens in Wayne County, North Carolina —1960. **M. H. Farrier and Alva L. Finkner, Dept. of Entomology, North Carolina State College, Raleigh.**	**159.** Dermal Applications and Injections of Co-Ral for Systemic Control of Cattle Grubs. **R. O. Drummond and O. H. Graham, Ent. Res. Div., ARS, USDA, Kerrville, Texas.**	**183.** Autumn Spraying of Decked Pine Logs to Prevent Damage by Wood-Boring Insects. **W. B. Becker and H. G. Abbott, Univ. of Mass., Amherst.**

	A. General Entomology Chairman: Lewis Berner Garden Room	B. Physio. & Toxicol. Chairman: F. W. Fisk Vernon Room	C-a. Biological Control Chairman: J. D. Briggs Tower Room
2:18	**8.** Report on Insect Collecting of Barro Colorado Island, Canal Zone, Panama. **C. F. Harbison, San Diego Natural History Society, Natural History Museum, San Diego, Calif.**	**48.** Bio-assay of DDVP Vaporization from Treated Surfaces. **Richard N. Lyness, Agricultural Specialties, Dallas, Texas.**	**89.** A Bioassay Method for *Bacillus thuringiensis* Berliner. **F. L. McEwen and C. M. Splittstoesser, N. Y. State Agr. Exp. Station, Geneva.**
2:30	**9.** Eggs of Insects Showing Characteristics of Taxonomic Significance. **Alvah Peterson, Ohio State University, Columbus.**	**49.** Developmental Sensitivity of the Desert Locust to Gamma Radiation— **Part 1: Hatchlings. Samir F. El-Miniawi, Locust Res. Station, Plant Protection Dept., Ministry of Agriculture, Cairo, Egypt, U.A.R.**	**90.** Variables in the Quantitative Bioassay of *Bacillus thuringiensis*. **John D. Briggs and Helmuth Cords, Bioferm Corporation, Wasco, Calif.**
2:42	**10.** The Odoriferous Secretion of *Scaptocoris* (Hemiptera: Pentatomidae). **Louis M. Roth and M. Bazinet, United Fruit Co., Mass., and U.S.A., QM Labs., Mass.**	**50.** On the Influence of DDT Treatment on Reproduction in a Spider Mite. **Hassan H. Attiah and H. Bruce Boudreaux, La. St. Univ., Dept. of Zool., Baton Rouge.**	**91.** The Reaction of Quail (*Coturnix coturnix japonica*) to Oral Administrations of Commercial Formulations of *Bacillus thuringiensis* Berliner. **A. L. Borgatti and G. E. Guyer, Dept. of Ento., Mich. State Univ., East Lansing.**
2:54	**11.** The Chemical Defense Mechanism of the Mexican Bean Beetle, *Epilachna varivestris* Muls. **T. Eisner and G. Happ, Cornell University, Ithaca, N. Y.**	**51.** Electrical Responses of Eyes of Insecticidally Treated Mosquito Larvae. **A. M. Kolkaila and L. K. Cutkomp, Dept. of Ent. & Ec. Zool., Univ. of Minn., St. Paul.**	**92.** Further Studies On the Use of Commercially Produced *Bacillus thuringiensis* to Control the Cabbage Looper. **Irvin M. Hall, Dept. of Biological Control, Citrus Experiment Station, Univ. of Calif., Riverside.**
3:06	**12.** The Defensive Spray of the Whipscorpion, *Mastigoproctus giganteus* Lucas. **T. Eisner, J. Meinwald, A. Monro, and R. Ghent, Cornell University, Ithaca, N. Y.**	**52.** Fluorescent Constituents of Roach Blood Following Insecticidal Treatment and Stress. **N. G. Patel and L. K. Cutkomp, Univ. of Minn., St. Paul.**	**93.** The Introduction, Colonization, and Establishment of *Bathyplectes curculionis* (Thom.), a Parasite of the Alfalfa Weevil in the Eastern United States. **Benjamin Puttler, D. W. Jones, and L. W. Coles, ARS, USDA, Moorestown, N. J.**
3:18	**13.** Contributions Toward a Species Concept in Cimicidae (Hemiptera). **Robert L. Usinger, Univ. of Calif., Berkeley.**	**53.** Metabolism of Shell Compound #4294 in a Sheep and a Goat. **W. F. Chamberlain and D. E. Hopkins, Ent. Res. Div., ARS, USDA, Kerrville, Texas.**	**94.** The Biological Control of Aphids in California. **Evert I. Schlinger and Robert van den Bosch, Dept. Biological Control, Univ. of Calif., Riverside.**

C-d. Ecology & Bionomics Chairman: G. G. Gyrisco Viking Theater	D. Med. & Vet. Ent. Chairman: C. N. Smith Mandarin Room	F. Chemical Control Chairman: R. J. Norton Rutland Room
127. Evaluating the Effect of European Corn Borer Populations on Corn Yield. **J. L. Jarvis, T. R. Everett, T. A. Brindley, and F. F. Dicke, ERD, ARS, USDA, Ankeny, Iowa.**	**160.** Studies on Ixodorhynchine Mite Parasites (Acarina: Mesostigmata) of North American Snakes. **Donald E. Johnston, Institute of Acarology, Univ. of Md., College Park.**	**184.** Malathion as a Grain Protectant. **R. G. Strong and D. E. Sbur, Univ. of California, Citrus Experiment Station, Riverside.**
128. Occurrence of Grape Phylloxera in the Chautauqua Grape Belt of New York. **E. F. Taschenberg, N. Y. State Agr. Expt. Sta., Geneva.**	**161.** New Army Centrifugal Sprayers. **Clyde S. Barnhart, Sr., Dept. of the Army, U. S. Army Engr. Res. & Dev. Labs., Corps of Engineers, Ft. Belvoir, Va.**	**185.** Malathion as a Protectant Against Insect Infestation of Bagged Animal Feed. **B. W. Clements, Jr., H. B. Gillenwater, and M. F. Phillips, Stored-Product Insects Lab., AMS, USDA, Savannah, Ga.**
129. The Influence of Humidity and Water on Fecundity and Longevity of the Plum Curculio *Conotrachelus nenuphar* (Hbst.). **E. H. Smith, New York State Agr. Exp. Station, Geneva.**	**162.** The Oral Secretion of Fleas as Related to Flea Bite Hypersensitivity. **E. Benjamini[1], Ben F. Feingold[1], and L. Kartman[2], [1]Kaiser Foundation Res. Inst., Lab. of Med. Ent., San Francisco, Calif. [2]Tech. Br., CDC, PHS, HEW, San Francisco, Calif.**	**186.** Imide Compounds as Insect Repellents for Use on Protective Packaging. **Dean F. Davis and Richard H. Guy, Stored-Product Insects Laboratory, AMS, USDA, Savannah, Ga.**
130. Bionomics of the Eye-Spotted Bud Moth, *Spilonota ocellana* D. & S., on Sour Cherry in Wisconsin. **Earl R. Oatman, Dept. of Ent., Univ. of Wisc., Madison.**	**163.** Tick Paralysis in Eastern North America. **Dale W. Jenkins, Ento. Div., U. S. Army, Chem. Corps Biological Labs. Fort Detrick, Md.**	**187.** The Effect of Sevin on Honey Bee Colonies. **R. A. Morse, Dept. of Ent., Cornell Univ., Ithaca, N. Y.**
131. Ecological Studies of the Fruit Tree Leaf Roller, *Archips argyrospila* (Wlk.), in Quebec Apple Orchards. **R. O. Paradis, Res. Lab., C.D.A., St. Jean, Quebec, Canada.**	**164.** Experiences with Sevin for the Control of Ectoparasites on Small Animals. **Byron Williamson and Richard N. Lyness, Agricultural Specialties, Dallas.**	**188.** Study of the Basic Factors Influencing the Efficiency of Granular Insecticides in Mosquito Control. **Mir S. Mulla and Harold Axelrod, Univ. of California, Citrus Experiment Station, Riverside.**
132. Some Factors Affecting Oviposition and Egg Viability of the Tobacco Wireworm [*Conoderus vespertinus* (F.)]. **S. G. Turnipseed and R. L. Rabb, N. C. St. Col., Raleigh.**	**165.** Studies on Detachment of Adult *Amblyomma americanum* (L.). **K. L. Knight[1], D. E. Bryan[2], and C. W. Taylor[1], [1]U. S. Naval Med. Field Research Lab., Camp Lejeune N. C. [2] Dept. of Ent., Okla. State Univ., Stillwater.**	**189.** Biological and Chemical Methods for Soil Residue Analysis. **P. R. Sferra, F. L. Gambrell, and G. L. Mack, N. Y. State Agric. Expt. Station, Geneva.**

WEDNESDAY, P.M., NOVEMBER 30

3:30 to 4:00	**PLENARY SESSION—Vernon Room** **Invitational Address:** Contributions of Medical and Veterinary Entomology to Human Welfare. E. F. KNIPLING, ERD, ARS, USDA, Beltsville, Md. (Sponsored by Section D)
4:00 to 5:30	**FINAL ESA BUSINESS MEETING, Vernon Room**
5:30	**DINNER RECESS**

WEDNESDAY EVENING, NOVEMBER 30

PLENARY SESSION—Vernon Room

7:30 4-H Club Demonstration

7:45 **Invitational Address:**

The Role of Chemicals in Wildlife Conservation. LESTER G. MACNAMARA, *Chief*, Bur. Wildlife Mgmt., N. J. Dept. of Conservation and Economic Development, Trenton. (Sponsored by Section E)

8:15 Report of the XIth International Congress of Entomology, Vienna, Austria, August 17–25, 1960, with illustrations.

Moderator —EDWARD H. SMITH, N. Y. Agr. Exp. Sta., Geneva.

Participants—D. M. DELONG, Ohio St. Univ., Columbus.

C. E. HOPLA, Univ. of Okla., Norman.

C. N. SMITH, ERD, ARS, USDA, Orlando, Fla.

F. F. SMITH, ERD, ARS, USDA, Beltsville, Md.

THURSDAY, A.M., DECEMBER 1, 9:00 TO 10:24

	B. Physio. & Toxicol. Chairman: M. S. Blum Vernon Room	C-d. Ecology & Bionomics Chairman: F. R. Lawson Viking Theater	E-a. Extension Solarium	F. Chemical Control Chairman: M. M. Barnes Rutland Room
9:00	**PLENARY SESSION—Vernon Room** **Invitational Address:** Insects' Greatest Competitor, HARLOW B. MILLS, Ill. Nat. History Survey, Urbana. (Sponsored by Section A)			
9:36	**54.** Effect of Thiamine on Delayed Organophosphate Neurotoxicity in Chickens. **Ronald L. Baron and John E. Casida, Dept. of Ent., Univ. of Wisc., Madison.**	**133.** Fluctuating Infestations of Spruce Budworm in the Central Rocky Mountains. **B. H. Wilford, U. S. Forest Service, Rocky Mtn. F. & R. Exp. Sta., Fort Collins, Colo.**	**Symposium II:** Recognizing Extension Problems and Searching for Solutions. *Moderator*: **Paul H. Wooley, Cornell Univ., Ithaca, N. Y.**	**190.** Factors Affecting the Evaporation of Water from Droplets in Airblast Spraying. **Roy T. Cunningham, J. L. Brann, Jr., and Glenn A. Fleming, Dept. of Ent., Cornell Univ., Ithaca, N. Y.**
9:48	**55.** Metabolic Degradation of 0,0-Dimethyl 0-(2,2-Dichlorovinyl) Phosphate (DDVP). **Ernest Hodgson and John E. Casida, Dept. of Ent., Univ. of Wisc., Madison.**	**134.** The Use of Multiple Correlation in the Evaluation of Larval Growth Criteria. **Dean L. Haynes and James W. Butcher, Dept. of Ent., Mich. St. Univ., East Lansing.**	Fly Control—A Look at the Future. **E. J. Hansens, Rutgers Univ., New Brunswick, N. J.**	
10:00	**56.** Stability of Allethrin and a Kerosene Solution of it in Storage as Demonstrated by Bioassay. **W. A. Gersdorff, P. G. Piquett, and Norman Mitlin, ERD, ARS, USDA, Beltsville, Md.**	**135.** Effects of Crowding On Aseptically Reared Larvae of *Aedes aegypti* **Walter L. Jones and Dwight M. DeLong, Dept. of Zool. & Ent., Ohio St. Univ., Columbus.**		
10:12	**57.** Specificity of Bioassay of Insecticide Residues, with Special Reference to Phosdrin Insecticide. **Yun-Pei Sun and John Sanjean, Agri. Res. Div., Shell Development Co., Modesto, Calif.**	**136.** Field Studies of the Behavior of Populations of *Aedes nigromaculis*. **A. R. Barr and B. Rosay. California State Dept. Public Health, Fresno.**	What is the Answer to Mite Resistance? **John Naegele, Cornell University, Ithaca, N. Y.**	
10:24	**58.** Influence of Codistillation and Soil Cultivation on the Persistence of Insecticidal Residues in Soils. **E. P. Lichtenstein, Dept. of Ent., Univ. of Wisc., Madison.**	**137.** The Biology of Dewinged *Culex tarsalis*. **Jowett Chao, Dept. of Zool., Univ. of California, Los Angeles.**		

THURSDAY, A.M., DECEMBER 1, 10:36 TO 11:36

	B. Physio. & Toxicol. Chairman: M. S. Blum Vernon Room	C-d. Ecology & Bionomics Chairman: F. R. Lawson Viking Theater	D. Med. & Vet. Ent. Chairman: C. N. Smith Mandarin Room	E-a. Extension Solarium Symposium continued
10:36	**59.** Survival Mechanisms in Multi-resistant *Musca domestica*. **Andrew J. Forgash, Benjamin J. Cook and Robert C. Riley, Rutgers Univ., New Brunswick, N. J.**	**138.** Some Observations on Mosquito Larvae and Pupae Confined to a Bottom Air-Water Interface. **Roger Meola and Dwight M. DeLong, Dept. of Zoology, Ohio St. Univ., Columbus.**	**166.** The Use of Sprays and Aerosol Formulations Containing Dimethoate and R-1207 for Fly Control on Cattle and in Dairy Barns and the Determination of Residues in Milk. **Tien-Hsi Cheng, Henry F. Enos, Jr., and Donald E. H. Frear, Pa. St. Univ., University Park.**	Extension Publications. **G. B. MacCollom, Univ., of Vt., Burlington.**
10:48	**60.** Gain and Loss of Diazinon Resistance in *Musca domestica*. **Andrew J. Forgash and Elton J. Hansens, Rutgers Univ., New Brunswick, N. J.**	**139.** Mosquito Eggs Free of Microorganisms. **Jowett Chao, Dept. of Zoology, Univ. of Calif., Los Angeles.**		
11:00	**61.** Biochemistry of Malathion-Resistance in *Culex tarsalis*. **F. Matsumura and A. W. A. Brown, Univ. Western Ontario, London, Canada.**	**140.** The Abundance of Aquatic Insects in Stream Riffles. **Chad M. Murvosh, Dept. of Zool., & Ent., Ohio St. Univ., Columbus.**		How Does Rapid Urbanization Affect the Extension Entomology Program? **John L. Libby, Rutgers University, New Brunswick, N. J.**
11:12	**62.** Relationship of Chemical Structure to Organophosphorus Resistance. **Ralph B. March, Univ. of Calif., Citrus Exp. Sta., Riverside.**	**141.** Ratios of Sodium, Potassium and Calcium Ions Required for Maintaining the Heartbeat of the Housefly, *Musca domestica* L. **D. Robert Brebbia, Biological Lab., Fordham Univ., New York, N. Y.**		
11:24	**63.** Peritrophic Membrane as Vehicle for DDT and DDE Excretion in *Aedes aegypti* Larvae. **Z. H. Abedi and A. W. A. Brown, Univ. of Western Ontario, London, Canada.**	**142.** The Role of Some Visual Factors in the Host Orientation of *Tabanus* species (Tabanidae: Diptera). **G. K. Bracken, Wm. Hanec, and A. J. Thorsteinson, Dept. of Ent., The University of Manitoba, Winnipeg, Canada.**		Methods Used in Trying to Solve Some Insect Problems Around Metropolitan Areas. **Henry Menusan, Jr., Pa. St. Univ., University Park.**
11:36	**64.** Assessing Insecticide Resistance in the Codling Moth. **M. M. Barnes and H. R. Moffitt, Univ. of Calif., Riverside.**	**143.** Seasonal Biology of *Chermes piceae* (Ratz.) on Mt. Mitchell, North Carolina. **Gene D. Amman, SE Forest Expt. Sta., Asheville, N. C.**		

THURSDAY, A.M., DECEMBER 1, 11:48 TO 12:24

	B. Physio. & Toxicol. Chairman: M. S. Blum Vernon Room	C-d Ecology & Bionomics Chairman: F. R. Lawson Viking Theater	E-a. Extension Solarium Symposium continued	
11:48	**65.** Stability of Cross Resistance in the Two-Spotted Spider Mite (*Tetranychus telarius* L.). **John A. Naegele, Dept. of Ent., Cornell Univ., Ithaca, N. Y.**	**144.** The Use of Preceding Weather Conditions in Forecasting Grasshopper Outbreaks. **Roy L. Edwards, Can. Ag. Res. Stn., Saskatoon, Saskatchewan.**		
12:12	**66.** Thermal Response as a Criterion of Intoxication in the Two-Spotted Spider Mite *Tetranychus telarius* L. **J. A. Naegele, W. D. McEnroe, and K. N. Mehrotra, Dept. of Ent., Cornell Univ., Ithaca, N. Y.**		The 4-H Entomology Program in Michigan. **Alfred C. Dowdy, Mich. St. Univ. East Lansing.**	
12:24			4-H Club Entomology Demonstration.	

NOON RECESS

THURSDAY, P.M., DECEMBER 1

B. PHYSIOL. AND TOXICOL. Chairman M. S. Blum, Vernon Room

	1:30—67. Methods of Determining Insecticide Tolerance of the Sugar-Beet Root Maggots. **W. R. Allen, C.D.A. Agricultural Research Station, Winnipeg Manitoba, Canada.**	**1:42—68** Alkaloids, Enzyme Inhibitors, and Insect Resistance in Plants. **W. H. Orgell, Dept. of Zool. & Ent., Iowa Sta. Univ., Ames.**	**1:54—69.** Boll Weevil Resistance to Insecticides in Texas. **J. C. Gaines and J. R. Brazzel, Dept. of Ent., Texas Agr. Expt. Sta., A & M. Col. of Texas, College Station.**	**2:06—70** *In Vitro* Activation and Inhibition of Organophosphates. **P. A. Dahm, B. E. Kopecky, and C. B. Walker, Iowa St. Univ., Ames.**
	2:18—71. Studies on Synergism of Carbamate Insecticides. **G. P. Georghiou, Citrus Expt. Sta., Univ. of Calif., Riverside.**	**2:30—72.** Metabolism of P^{32} Labeled Paraoxon in Normal and Phosphate-Resistant Strains of the Mosquito *Aedes nigromaculis* Ludlow. **Donald C. Mengle and Larry L. Lewallen, Calif. Dept. of Public Health, Fresno.**	**2:42—72A.** Effects of SKF525A on organophosphate metabolism. **R. D. O'Brien, Cornell Univ., Ithaca N. Y.**	

SYNOPSES

SECTION A. General Entomology

1. H. Bruce Boudreaux and A. N. Tissot. Consistent morphological and color differences, plus nymphal color patterns and setae, host preferences and habits have been employed to recognize 9 new species previously confused with *M. bella* (Walsh), *M. walshii* (Monell) and *M. meridionalis* Granovsky. All are apparently confined to North America, and inhabit various species of red or black oaks. New diagnoses are presented for *M. bella* and *M. walshii*, which were inadequately originally described. Keys to nymphs and to alate viviparae are presented, and relationships among the species are considered.

2. B. Elwood Montgomery. The depositories of the types of American Odonata are being listed in the course of preparation of a catalog of New World species. The principal European museums were visited to study types. Descriptions of the more important Odonata collections are given.

3. T. J. Walker, Jr. Some of the taxonomic problems in this group of weed-inhabiting tree crickets have been clarified by studies of biology, of calling songs, and of previously overlooked morphological characters.

4. Ashley B. Gurney. Several new species of Grylloblattidae from western North America and Japan have been discovered recently. Male genitalia are an increasingly important source of specific characters. Caves are a valuable newly recognized habitat for these rare insects.

5. J. Forbes and R. W. Brassel. The sclerotization and shapes of the male genitalic valves and terminal segments of *P. lucidus*, *P. rufescens breviceps*, *P. rufescens bicolor*, and *P. rufescens umbratus* are distinctive for each of the species and subspecies studied. The configuration of sternum IX considered with the shape and arrangement of the middle valve constitutes the characters most indicative for each.

6. Ellis G. MacLeod. Morphological studies on the head capsule of the larvae of planipennian Neuroptera show that the structure of the jaw articulations, cranial sulci and tentorium may be of aid in tracing the relationships within this order.

7. V. H. Zeve and D. E. Howell. Three species of *Trichobius*: *corynorhini*, *major* and *sphaeronotus*, were collected from bat caves in northwestern Oklahoma. A detailed morphological study of the head and its appendages is presented for all three species. Examination of a long series of specimens revealed extensive external morphological variations within each species.

8. C. F. Harbison. In September 1958, Barro Colorado Island, Canal Zone, Panama for two weeks. Afternoons collecting along trails in tropical rain forests. Nights at electric lights on two sides of dining room. Mornings packing collected materials for trip to California. Kodachrome slides to illustrate talk.

9. Alvah Peterson. Eggs of insects showing characteristics of taxonomic significance. Synopsis colored microphotographs of eggs of insects illustrating characters of family or generic significance, also the eggs of many are diagnostic to species.

10. Louis M. Roth and M. Bazinet. Timonin (1957) found that a fossorial Hemipteran *Scaptocoris* sp., which feeds on the roots of bananas, secretes an odoriferous substance which inhibits or kills the fungus *Fusarium oxysporum* f. *cubense*, the causal agent of Panama disease of bananas.

The odoriferous glands of this bug are described and a preliminary analysis of the secretion, employing mass spectrographic analysis, is given.

11. T. Eisner and G. Happ. "Reflex bleeding" in the adult and larvae is discussed, and evidence for its defensive significance is presented.

12. T. Eisner, J. Meinwald, A. Monro, and R. Ghent. The spray of the whipscorpion consists of 84% acetic acid, 5% caprylic acid, and 11% water. It can be aimed accurately in all directions, and is extraordinarily effective in defense against vertebrate and invertebrate predators. The caprylic acid acts as a wetting agent, and also promotes the penetration of the acetic acid.

13. Robert L. Usinger. Cross breeding experiments reveal that the common species of *Cimex* are really species complexes. As a result of crosses and analyses of geographical variants the number of valid species of *Cimex* is reduced to four: *C. lectularius L.*, *C. hemipterus* F., *C. pilosellus* Horv., and *C. pipistrelli* Jenyns.

SECTION B. Physiology and Toxicology

14. R. L. Patton. The blood of insects is a nearly neutral fluid serum with free floating disk-shaped cells. The physiological state of this system varies naturally and under the influence of various external factors. These variations influence the response of insects to insecticides and other biologically active agents.

15. Joan M. Whitten. Studies on injected and living pupae of Diptera reveal varying degrees of histolysis in the tracheal system whereas in most Nematocera no tracheal histolysis occurs, in the *Cyclorrhapha schizophora* histolysis is extensive. In certain Nematocera, Brachycera and *Cyclorrhapha aschiza* intermediate conditions are found that are of physiological and phylogenetic interest.

16. G. P. Waldbauer and G. S. Fraenkel. Maxillectomized, fourth instar *P. sexta* larvae fed to varying degrees on leaves of a number of non-solanaceous plants which were usually rejected by normal larvae. Heavy feeding, good growth and survival to pupation occurred on some Compositae, some allies of the Solanaceae and a few other plants.

17. G. P. Waldbauer and G. S. Fraenkel. Maxillectomized *P. sexta* larvae were raised through the fourth instar on the leaves of tomato, *Solanum dulcamara*, *Taraxacum officinale*, *Arctium minus* and *Plantago rugelii*. The dry weight of food consumed per gram of insect per day, the percent digested and the per cent converted to body matter were measured.

18. Paul A. Woke. By planned observations, probing, biting, and acceptance of blood meals by the mosquitoes *Aedes aegypti* and *Haemagogus equinus* were found to be related to various conditions of the alimentary canal, to previous meals of blood and carbohydrates, to different conditions of the ovaries, and to age and prior sexual activity.

19. F. A. McKittrick and T. Eisner. The elaborate egg-laying behavior of this cockroach involving concealment of the ootheca is discussed, and phylogenetic comparison is made with that of other species.

20. William D. McEnroe. The cholinesterase system in the two-spotted spider mite (*Tetranychus telarius* Linn.) was investigated by histochemical methods. A reaction specific to the nervous system and similar to acetylcholinesterase was found in the nervous system.

21. E. Helen Salkeld. Embryos of the large milkweed bug *Oncopeltus fasciatus* were removed from the egg at different times during their development and were subjected to various histochemical tests for esterases. The types of esterases and their distribution in the developing embryo are compared and discussed.

22. J. R. Adams. Differences were noted in distribution of tarsal and labellar contact chemoreceptors between ten flies of each sex. Histological investigations were conducted using light and electron microscopy. Behavioral studies involving amputation of certain sensory organs of flies enabled a determination of their role in the response of flies to repellents.

23. A. Glenn Richards. Collation of data from this laboratory with that in the literature now permits recognition of a minimum of six major steps in sclerotization plus a number of side reactions. Although the chemical events are still largely unknown we are approaching the intermediary metabolism of sclerotization.

24. A. Glenn Richards. Serial sections show that the ventral diaphragm of the moth *Anagasta* (*Ephestia*) *kuhniella* develops during the pupal stage by proliferation of cells in the perilemma on the dorsal side of the abdominal nerve cord. It is therefore an integral part of the connective tissue sheath of the nerve cord.

25. J. R. Larsen Jr. Chemosensory hairs from the labellum of *Phormia regina* were studied in the electron microscope. An attempt was made to observe the relationship of nerve fibers in the hair to the hair tip and to observe the exact structure of the tip. Structures were seen in the hair which were not previously described.

26. R. E. Gingrich. Methods were investigated for the *in vitro* demonstration of antibodies to soluble and particulate antigens. Immunoelectrophoresis was used to locate a hemolymph component involved in the response.

27. B. R. Wilson and Maryellen Marrow. Results are given of studies which have been conducted on the solubility, nitrogen, amino acids and amino sugars of praying mantid egg glue. The results indicate a predominantly protein structure which is insoluble in most common solvents.

28. Roy J. Barker, Leland N. Edmunds, Jr., and Charles F. Cohen. Lipids were chromatographed into hydrocarbons, sterol esters, triglycerides, fatty acids, free sterols, diglycerides, monoglycerides, and phospholipids. Each fraction was further characterized by infrared spectra, gas chromatography, and colorimetric tests.

29. Spiro J. Louloudes, Donald B. Moyer and James H. Starkey III. The hydrocarbon fraction from adult house flies was investigated using paper, column and gas-liquid chromatography and mass spectrometry. The composition of this fraction in several species is compared.

30. Ernest Hodgson and John E. Casida. Rat liver microsomes, in the presence of reduced triphosphopyridine nucleotide and oxygen, oxidize the alkyl groups of many N,N-dialkyl carbamates. Details of the mechanism, the nature of the product, and inhibition by SKF-525-A, piperonyl butoxide and sesamex will be discussed. Results indicate a similar mechanism may occur in insects.

31. Norman Mitlin and Charles F. Cohen. The composition of ribonucleic acid was determined in the growing ovaries of a normal and a resistant house fly strain at 24-hour intervals. The molar, purine/pyrimidine, and 6-amino/6-keto ratios were measured. No striking differences between normal and resistant strains were noted.

32. Donald J. Sutherland. Cockroach hyaluronidase, partially purified from salivary glands and whole cockroaches, differed from testicular hyaluronidase in substrate specificity and activators. Histochemical methods failed to detect the substrate, hyaluronic acid, in salivary glands or alimentary canal. The substrate was extracted from laboratory food. Hyaluronidase activity of cockroaches was influenced sometimes by diet.

33. Morris Rockstein and Donald Gutfreund. The ATP, ADP and AMP content of the thorax of the house fly was determined by the Carter and Cohn differential elution column chromatographic procedure, in the flight muscle giant mitochondria and extrasarcosomal fractions of the flight muscle, in house flies of both sexes, according to variations in age.

34. James N. Liles. Mating affects the longevity of both male and female *Aedes aegypti*. The effects of mating on longevity are dependent upon age, diet, and frequency of mating in the experimental insects. Evidence is presented which indicates that the effects probably result from hormonal or nutritional action.

35. C. Fiore and D. Ludwig. Oxygen consumption, nitrogen content, phosphatase and cytochrome oxidase activities were determined for larvae and adults from young and old parents. Oxygen consumption was not affected, but nitrogen content and cytochrome oxidase activity were generally lower and alkaline phosphatase higher in specimens from old as compared with those from young parents.

36. Daniel Ludwig and Carl Fiore. Effects of parental age in *Tenebrio molitor* in offspring obtained from isolated pairs.

At 25°C., offspring from a single pair had a longer larval period and more molts when obtained from eggs laid soon after emergence than from those laid one or two months later. Parental age had no effect on the duration of adult life.

37. John J. Corrigan and Alton Meister. Studies on incorporation of amino acids into posterior silk gland fractions obtained by homogenization and centrifugation will be described. Factors required for incorporation, relative activity of the several fractions, and rates of incorporation of different amino acids will be considered in relation to the general problems of fibroin biosynthesis.

38. J. N. Kaplanis, R. E. Monroe, W. E. Robbins and Spiro J. Louloudes. When house flies were fed a diet containing H^3-β-sitosterol the sterol was found to be efficiently absorbed and utilized in egg production. Analysis of the H^3-compounds from the adults and eggs indicated the presence of several metabolites.

39. W. E. Robbins, R. C. Dutky, R. E. Monroe and J. N. Kaplanis. Nymphal German cockroaches were reared on a synthetic diet containing H^3-β-sitosterol. The isolated H^3-compounds were fractionated by chromatography and further analyzed to determine the nature of the metabolites.

40. R. E. Monroe, J. N. Kaplanis and W. E. Robbins. Cholesterol and β-sitosterol were added to the larval medium of house flies and the adults analyzed for tissue sterols and their total viable egg production determined on a sterol-deficient diet. Results indicated that sterol storage could be increased by qualitative rather than quantitative changes in the sterol content of the CSMA medium.

41. K. N. Mehrotra. Some of the key enzymes of the glycolytic pathway and that of the hexose monophosphate shunt were investigated in the two-spotted mite. The results indicate that both these pathways (glycolysis and hexose monophosphate shunt) are present in this organism.

42. M. A. Brooks. Chloride and choline levels were altered independently by feeding the citrates and chlorides of choline and sodium. Chloride was effective above 5 mM/Kg. but under 160 mM/Kg. in promoting rapid growth, high survival, and viable egg production. Value of high choline chloride levels seems partially due to chloride satisfaction.

43. J. R. Brazzel, T. B. Davich, and L. D. Harris. The boll weevil must attain a state of diapause to survive the winter in the temperate regions of the United States. Results obtained in recent tests indicate that chemical and cultural control practices in the fall caused great reduction in the diapausing boll weevil populations and may be effective for eradication.

SECTION B. (Continued)

44. N. L. Halleppanavar, L. K. Cutkomp, and N. G. Patel. *Sitophilus granarius* (L.) mortality in wheat treated with DDT was greater when small numbers of weevils were present. C^{14}-labelled DDT was used to determine pick-up. Several possible causes of the differences in mortality were investigated.

45. A. S. Tombes. The levels of DDT-dehydrochlorinase in all stages of the Mexican bean beetle, *Epilachna varivestis*, were determined. There was a reduction in the enzyme concentration at pupation, followed by an increase in the adult stage. The LD 50's of TDE for similar periods in the insects' development were obtained.

46. D. Pimentel. Insecticides effected important changes in the structure and physiology of the *Brassica oleracea* L. (Cruciferae) community. The number of species in some insecticide-treated communities was reduced to one-half, relative to the control community. Insecticides severely reduced the numbers of many species populations, but with some insect populations the insecticides caused population outbreaks of 10-fold increases.

47. M. H. J. Weiden and H. H. Moorefield. A novel class of DDT analogs showed an unexpected degree of toxicity to both DDT-susceptible and resistant house flies. Other fly strains produced by selection with non-dehydrochlorinatable DDT analogs are tolerant of the new compounds. These observations confirm the role of dehydrochlorination in DDT resistance.

48. Richard N. Lyness. DDVP vaporization from surfaces treated with various formulations of DDVP was measured by collecting air samples and by determining mortality rates of test insects. Rate of vaporization varied with the concentration and type of formulations. The Lt_{50} of test insects varied inversely with the concentrations of DDVP in the air.

49. Samir F. El-Miniawi. *Schistocerca gregaria* Forskäl as hatchlings was irradiated with gamma rays. Irradiation effects on mortality, longevity, lethargy and molting are observed. Results indicated lethality of small doses. They exert certain reactions on development similar to those of high doses but in contradirections.

50. Hassan H. Attiah and H. Bruce Boudreaux. Although a recent German study inferred that short exposures to DDT induced the untreated daughters of treated mites to increase the egg-laying rate nearly 100% over that of the treated mites, such treatments repeated in our laboratory have not confirmed this. Rather, the higher rates seem to be depressant upon treated mites, and to have no effect upon the untreated progeny.

51. A. M. Kolkaila and L. K. Cutkomp. Responses from eyes of *Aedes aegypti* larvae treated with DDT or paraoxon were recorded electrically following light stimulus. Comparisons between the two chemicals are presented.

52. N. G. Patel and L. K. Cutkomp. American cockroaches were treated with chlorinated hydrocarbons, organophosphates, or subjected to stress. Blood taken from the affected roaches was deproteinized and analyzed for fluorescent constituents using electrophoretic and chromatographic techniques. Certain differences were found and are reported.

53. W. F. Chamberlain and D. E. Hopkins. Both the alpha and beta isomers of Shell Compound #4294 were found in the blood. Excretion of radioactive material was mainly through the urine, and 61%-89% of all the radioactive material was as dimethyl phosphate. Less than 1.0% of all the radioactive material in the urine was Shell Compound #4294. Elimination was very rapid, with nearly 80% of the administered dose excreted within 48 hours.

54. Ronald L. Baron and John E. Casida. Because the symptoms of delayed organophosphate neurotoxicity and thiamine deficiency in chickens are similar, the effect of thiamine on the organophosphate neurotoxicity was investigated. Preliminary results concerning thiamine administration to chickens with DFP and TOCP-induced neurotoxicity will be discussed in relation to a possible neurological function of thiamine.

55. Ernest Hodgson and John E. Casida. DDVP is rapidly degraded in plants and mammals. Enzymes responsible for the hydrolysis of DDVP to phosphoric acid have been investigated, *in vitro*, in several mammalian tissues. Discussion will include the metabolic fate, *in vivo*, of the phosphorus and dichlorovinyl portions of the molecule in relation to the residue hazard.

56. W. A. Gersdorff, P. G. Piquett and Norman Mitlin. Stored allethrin and differently handled portions of a 1% kerosene solution of it were bioassayed several times in a 10-year period on the turntable against the house fly, *Musca domestica* L. It was demonstrated that the greater the exposure of the solution to light the greater the loss in toxicity.

57. Yun-Pei Sun and John Sanjean. This paper describes the principle and application of biological responses to some common insecticides and physical and chemical purifications for separation and identification of a specific residue in a mixture. Three characteristic properties have been used for the specific bioassay of Phosdrin insecticide residues in the presence of 10 organophosphorus insecticides. Bioassay of aldrin, dieldrin and endrin in mixed residues is also discussed.

58. E. P. Lichtenstein. Aldrin and DDT were applied to four different soils which were kept moist by watering. The experiments were designed to reduce or to favor codistillation. Insecticidal residue data were obtained at intervals from all soil types. The effect of soil cultivation on the persistence of insecticidal residues was also investigated.

59. Andrew J. Forgash, Benjamin J. Cook and Robert C. Riley. Three strains of house fly showing different levels of tolerance to Diazinon and numerous other insecticides were compared for penetration and metabolic differences. Resistance to Diazinon was correlated with penetration and resistance to DDT was correlated with DDT-dehydrochlorinase activity.

60. Andrew J. Forgash and Elton J. Hansens. The course of resistance to various insecticides was followed in house fly strains selected with Diazinon each generation and in strains which were removed from chemical pressure for varying numbers of generations before resuming selection.

61. F. Matsumura and A. W. A. Brown. Larvae of the malathion-resistant Fresno strain, when compared with a normal strain, detoxified malaoxon faster and produced more water-soluble metabolites thereof, the increase being greater in carboxyesterase than in phosphatase activity, and the result being a lower internal level of malaoxon after administration of malathion.

62. Ralph B. March. The toxicities of selected organophosphorus insecticides to a number of susceptible and organophosphorus resistant house fly strains were compared and evaluated. Relationships of chemical structure to resistance will be discussed and related to the selection history of the resistant strains.

63. Z. H. Abedi and A. W. A. Brown. Larvae of DDT-resistant strains when exposed to DDT excrete long streamers of peritrophic membrane, which contain about 5 gamma DDT and 0.5 gamma DDE per mgm. of membrane; larvae of susceptible strains, even when they survive, excrete less than one-fifth as much membrane, DDT and DDE.

64. M. M. Barnes and H. R. Moffitt. Rapid assessment of DDT resistance in the codling moth by topical application to the moth will be discussed. Reference curves from topical application of several organic phosphates and Sevin have been obtained using a non-resistant strain.

SECTION B. (Continued)

65. J. A. Naegele. Cross resistance between 4 acaracides within 5 selected strains of the two-spotted mites were followed after the termination of selection. Results indicate a degree of independence and instability in cross resistance.

66. J. A. Naegele, W. D. McEnroe and K. N. Mehrotra. Response of the two-spotted mite to thermal gradients is impaired by intoxication with certain toxicants. Preliminary data suggest that inhibition of thermal response may be a useful tool in the evaluation of resistant strains.

67. W. R. Allen. Effectiveness of insecticide-fertilizer mixtures is discussed in relation to sample distribution of mature maggots. The concentration of heptachlor and heptachlor epoxide required in the soil for control is considered. A method was developed to study the dosage mortality relationship on reared first instar larvae.

68. W. H. Orgell and E. T. Hibbs. The alkaloid and natural enzyme inhibitor content of various members of the Solanaceae and Leguminosae have been investigated in relation to feeding, oviposition, and damage by certain insects.

69. J. C. Gaines and J. R. Brazzel. The resistance level of the boll weevil, *Anthonomus grandis* Boh., to endrin and toxaphene was determined for several areas of Texas. Dosage-mortality curves were obtained by topical application. Results indicated resistance to certain chlorinated hydrocarbons in most areas of the State.

70. P. A. Dahm, B. E. Kopecky, and C. B. Walker. The *in vitro* activation of organophosphate insecticides by liver microsomes reveals significant differences when assayed manometrically with insect and mammalian cholinesterase. The activation of some of the organophosphates is strongly inhibited by pyrethrum synergists.

71. G. P. Georghiou. The type, degree and duration of synergism of carbamates by piperonyl butoxide, octachlorodipropyl ether, and other compounds against house flies and mosquitoes was investigated. The effect of the synergists was attributed to deactivation of carbamate-detoxifying mechanisms.

72. Donald C. Mengle and Larry L. Lewallen. The nature and quantity of hydrolysis products were determined following administration of paraoxon to mosquito larvae. Chromatographic results indicate differences in detoxification rate between the resistant and normal strains. Additional studies were made with P^{32}-labeled material attempting to correlate resistance with rate of hydrolysis.

72A. R. D. O'Brien. The protective effects of SKF525A against organophosphate poisoning in insects and mice, and its effect upon metabolism of parathion, paraoxon and schradan by cockroaches and mice, were studied. The compound inhibited activation of parathion and schradan and also the degradation of paraoxon.

SUB-SECTION C-a. Biological Control

73. George O. Poinar. Jr. and George G. Gyrisco. For the second consecutive season, nematode parasites were found in larvae of the alfalfa weevil. Soil samples and sweeps, along with laboratory studies, were used to investigate various aspects of the life history of this nematode. Morphological studies were made on the larval and adult forms of the nematode.

74. Joseph L. Saunders and Dale M. Norris, Jr. *Parasitaphelenchus oldhami* was found to be a common parasite in the body cavities of the smaller European elm bark beetle, *Scolytus multistriatus*. The biology and life history of the parasite have been determined and its relationship with the host will be discussed.

75. H. C. Coppel. Egg, larval, cocoon, and adult parasites or predators of *Diprion similis* (Htg.) were studied in 1959–60 in northwestern Wisconsin. Cocoon parasitism by Hymenoptera reached 44 percent. Egg and larval parasitism were negligible. Predation fluctuated widely but insects, birds, and spiders consumed large numbers of larvae and adults.

76. B. Loughton and A. S. West. Studies of spider predation on the spruce budworm have been carried out in New Brunswick over the past 3 years. The occurrence of predation was tested for serologically by means of the precipitin test. Results presented indicate a minimal predation rate at the host population levels cited.

77. A. T. Drooz. Larch sawfly (*Pristiphora erichsonii* (Htg.)) host material was both reared and dissected to determine the importance of the parasite, *Mesoleius tenthredinis*, in Pennsylvania and Upper Michigan. These examinations revealed important annual increases of parasitism in Pennsylvania, but that the host was quite immune in the Upper Michigan area.

78. Rafi Al-Hafidh and David Pimentel. House flies (*Musca domestica* L.) after 20 generations of selective pressure by the hymenopteran parasite (*Mormoniella vitripennis* (Wed.)) resist attack by the parasite.

79. W. P. Nagel and David Pimentel. A self-sustaining system, consisting of 16 inter-connected plastic cages, was devised for the maintenance of populations of the housefly, *Musca domestica* L., and the parasite, *Mormoniella vitripennis* (Wed.).

80. Vernon M. Stern and Evert I. Schlinger. *Trichogramma fasciatum* is a key parasite of certain field crop pests in California. Its dispersal habits were studied by feeding individuals radio-active P^{32} mixed in honey. In one test two million individuals were released and in a second test ten million individuals were released.

81. Dan Wolfenbarger and J. P. Sleesman. Varieties and Plant Introductions of the green kidney bean, (*P. vulgaris*), and the lima bean, (*P. lunatus*), were evaluated for insect resistance. *P. aureus*, *P. mungo*, and *P. lathyroides* are resistant to both insect species. While varietal differences are found relative to the leafhopper only species differences were found relative to the beetle.

82. D. Pimentel. Plant resistance to the cabbage butterfly, cabbage looper, diamondback moth, cabbage aphid, green peach aphid, flea beetles, and plant bugs was observed in the following varieties: broccoli, Brussels sprouts, cabbage, collards, and kale.

83. W. D. Guthrie and G. H. Stringfield. Genetic segregation for corn borer resistance, within five selfed generations of corn cultures in test-cross combination with a susceptible hybrid, diminished after each selfing. In view of a lingering segregation through the fifth generation it was concluded that test crosses for evaluating corn borer resistance were not practicable in the early selfed generations.

84. P. B. Dowden. Most of the imported parasites of the gypsy moth were recovered on Cape Cod in 1960 in spite of the fact that intensive spray programs have kept the pest at extremely low levels on the Cape since 1948.

85. Patrick T. M. Lum. *Psorophora howardii* Coq. was found infected by *Coelomomyces psorophorae* Couch thus extending the distribution of the fungus south to Florida. Two other forms presently unidentified were found infecting larvae and adults of *Aedes taeniorhynchus* (Wied.). Notes of the fungus in infected larvae and adults will be discussed.

86. William C. Haynes et al. Pure cultures of *Bacillus popilliae* Dutky and *B. lentimorbus* Dutky preserved by lyophilization retain their ability to initiate milkiness in larvae of the Japanese beetle (*Popillia japonica* Newman) and European chafer (*Amphimallon majalis* Razoumowsky). The degree of infectivity varies between species and strains for each microorganism and host insect.

SUB-SECTION C-a. (Continued)

87. Martin Shapiro and D. Pimentel. The effects of temperature, humidity, chemicals, light, and nutrition were studied on the host-parasite system involving the wax moth, *Galleria mellonella* L., and the nuclear polyhedral virus, *Borrelinavirus* sp. Two of the five factors, temperature, and nutrition, acted as stressors, i.e., increased the susceptibility of the host to the virus.

88. Robert E. Williams and D. M. DeLong. Techniques of handling larvae and the caging and feeding of adults are described. The behavior of this species in the field and in the cage, with observations on its usefulness as a control agent are discussed.

89. F. L. McEwen and C. M. Splittstoesser. The insecticidal activity of *Bacillus thuringiensis* Berliner can be determined through bioassay with the cabbage looper *Trichoplusia ni* (Hubner). The bacillus is incorporated in an enriched agar medium used as a feeding substate. Sufficient concentrations are included to establish an activity curve.

90. John D. Briggs and Helmuth Cords. The quantitative biological assay of *Bacillus thuringiensis* using young larvae of *Estigmene acrea* was studied. The influence of the controllable variables (age and origin of insects, test food preparation, etc.) on the dose response curve was evaluated and the statistical reproducibility of the assay was determined.

91. A. L. Borgatti and G. E. Guyer. *B. thuringiensis*, in wettable powder and feed additive formulations, was fed to Japanese quail at rates of from 0.2% to 3% of the diet. Two of the wettable powders produced a septicemia at the higher rates. Significant differences in food consumption, egg production and hatchability also resulted from these treatments.

92. I. M. Hall. A number of commercial preparations containing *Bacillus thuringiensis* were tested on vegetable crops for the control of the cabbage looper, *Trichoplusia ni*. These microbial materials performed in a satisfactory manner, and some gave control and residual activity that were equal to the best of the effective standard chemical insecticides

93. Benjamin Puttler, D. W. Jones, and L. W. Coles. *Bathyplectes curculionis* (Thom.) a parasite of the alfalfa weevil was introduced into the eastern United States in 1959 and 1960. Recoveries in 1960 from 1959 releases indicate its establishment in a number of release sites in New Jersey, and at one locality each in Delaware and Virginia. Methods of collecting, rearing, release, and recovery of the parasite are discussed.

94. E. I. Schlinger and Robert van den Bosch. Results of five years' research on the biological control of several economic aphids are outlined. Bionomics of the imported parasites—*Aphidius smithi*, *Trioxys pallidus* and three spotted alfalfa aphid parasites—are discussed. The efficiency of these parasites as biological control agents is indicated.

SUB-SECTION C-c. Relations of Insects to Plant Diseases

97. John N. Simons. Acquisition and inoculation threshold periods were less than 1 hr. A latent period of 24–48 hr. was found. Virus retention was correlated with length of acquisition feeding. Evidence for multiplication of virus in the vector was negative. Similarities in insect relationships and host symptomotology with western curly top were apparent.

98. O. S. Bindra. *Myzus persicae* (Sulz.), *M. circumflexus* (Buckton), *M. ornatus* Laing, *Rhopalosiphum pseudobrassicae* (Davis), and *Macrosteles fascifrons* Stal. were allowed prolonged feeding on *Physalis floridana* before inoculation. The results indicate that feeding by the first two species reduced the susceptibility of this plant to infection with potato leafroll virus by *M. persicae*.

99. O. S. Bindra. Plant resistance, interference in feeding, and effect of feeding on the susceptibility of *Physalis floridana* were examined. The deviation of the actual transmission by groups of *M. persicae* from that expected under the binomial assumptions could not be explained by these three hypotheses. The results indicate that these were chance deviations.

100. D. L. McLean. Following feeding on a lettuce mosaic virus source plant, alate green peach aphids were flown on a pin for various time periods and their percent of transmission was compared with alate aphids that did not fly and apterous aphids. Results indicated little overall difference in transmission efficiency.

101. George H. Kaloostian. Airplane application of 1½ lbs. of DDT per acre to mixed weeds adjacent to a peach orchard reduced the population of *Hemalodisca coagulata* (Say) to a point apparently effective in changing the annual pattern and incidence of spread of the virus disease.

SUB-SECTION C-d. Ecology and Bionomics

103. Donald G. Cochran. DDT-resistant and non-resistant strains of the German cockroach were crossed reciprocally. F_2 crosses and certain backcrosses were also made. Roaches from the various strains and crosses were assayed for resistance by treatment with appropriate concentrations of DDT. The results indicate a simple mechanism for the inheritance of DDT-resistance in this species.

104. A. W. A. Brown. The inheritance of DDT-resistance in (i) the Trinidad DDT-resistant strain, (ii) the Penang strain made DDT-resistant by DDT pressure, (iii) the Penang strain made DDT-resistant by malathion pressure, and (iv) the dieldrin-resistant Puerto Rico strain with a cross-resistance to DDT, has been investigated with the use of marker genes on the 2 autosomes.

105. Sister Alma Louise Mescher. Salivary glands were taken from larvae reared under special conditions of feeding and temperature. These had large, regularly banded, polytene chromosomes. Preliminary chromosome maps have been constructed. Strains showed characteristic variation with respect to size of salivary gland nuclei and diameter of chromosomes.

106. R. C. VandeHey. Several laboratory strains of *Aedes aegypti* were analyzed for genetic variation by an inbreeding method. Visible abnormalities in F_2 progeny of single pair matings were tested for inheritance. 63 mutants of 20 different kinds were recovered from 37 parental pairs. On the average, every mosquito carried a hidden mutant character.

107. G. B. Craig, Jr., W. A. Hickey and R. C. VandeHey. An inherited factor causes a predominance of males in certain strains and in progeny of single pairs of *Aedes aegypti*. This factor behaves as a dominant, is transmitted only by males and is not due to differential mortality, at least in post-gametic stages. Mass release of male-producing males might be used in control operations.

108. Sister Mary Gerald Leahy. Mass crosses and artificial insemination were used in attempts to produce hybrids between *Aedes aegypti* and *A. albopictus*. Isolating mechanisms which inhibit hybridization include 1) behavior 2) structural incompatibility 3) sperm immobilization through an insemination reaction 4) reduced egg production 5) genome incompatibility resulting in monster embryos.

109. D. Pimentel. The feed-back mechanism operates through the genetic integration of herbivore and plant, parasite and host, and predator and prey in the food chain of the ecosystem. It functions ecologically as a regenerative system through the dynamics of density pressure, selective pressure, and genetic change.

SUB-SECTION C-d. (Continued)

111. E. Gorton Linsley. *Lycus fernandezi* and its sibling, *L. loripes* and its sibling, and other *Lycus* spp. serve as models for well-defined beetle and moth mimics when gathered in drinking aggregations, in feeding and mating aggregations, and under dispersed conditions. Population and behavioral data have revealed some of the mechanisms which permit the mimicry to function, hold the mimetic complexes together, and stabilize the diverse color patterns involved by means of natural selection.

112. H. Bruce Boudreaux. The ratio of females to males is correlated with the amount of sperm furnished in a single mating. This supply depends upon the condition of the male and the time spent in copula. Males labelled with H^3-thymidine were used to investigate the site of fertilization.

113. T. J. Henneberry and Floyd F. Smith. The reproductive rate of two strains of two-spotted spider mite increased as the nitrogen supply to and absorption by the plant increased. Increased reproductive rate was positively correlated to increases in water-soluble carbohydrates present in the leaf tissue.

114. A. L. Boswell and Floyd F. Smith. *T. telarius* and *T. cinnabarinus* females tend to mate with their own kind when males of each species are present in equal numbers; with 3 to 5 times as many males present, female offspring of most mated females are sterile hybrids. Female mites are essentially monogamous, males are polygynous.

115. L. Chandler. Studies have shown *Halictus ligatus* Say to be a social bee. Direct and indirect evidences supporting queen-worker differentiation are derived from morphological, ethological, physiological and phenological data. Intercaste and intracaste relationships, seasonal nest development and natural enemies are discussed.

116. K. P. Katiyar and W. H. Long. Data are presented to show that the sugarcane borer, *Diatraea saccharalis* (F.), probably enters a facultative diapause annually in nature. Diapause was observed to begin in the early fall and lasted approximately 3 months. Preliminary studies relating to environmental factors which initiate diapause and other related phenomena are discussed.

117. C. D. LeSar. In Costa Rica and Honduras, *O. costaricensis* (Hymenoptera: Eucharidae) blemishes bananas by ovipositing in the peel of hanging fruit. At least four of the five species of *Pheidole* (Hymenoptera: Formicidae) present in banana plantations serve as hosts for this wasp parasite. Details of the biology of *Orasema* are given.

118. T. L. Stringfellow and J. S. Roussel. Life history studies revealed that *Myzus hemerocallis* Takahashi has 4 molts and an average longevity of 26.5 days. First offsprings are produced at an average age of 16.2 days. The average number of offspring was 15.1. The greatest populations occur during the late winter and early spring with low populations present in the summer months. The aphid is known to occur through Louisiana, and reported from California, Florida and Mississippi. Effective control was obtained with malathion, demeton and dimethoate.

119. S. R. Race. Mounds were studied to determine temperature variations and gradients. The effects of temperature and sunlight on mound entrance positions are discussed.

120. H. H. Tippins, L. W. Morgan and C. M. Beckham. *Derobrachus brevicollis* larvae were first observed damaging bahia grass in Georgia in 1958 and are now serious pests. Laboratory and field observations on the biology and habit of the insect are discussed.

121. E. H. Glass and G. E. R. Hervey. A technique for continuous rearing of the red-banded leaf roller in the greenhouse is described. Large numbers of larvae are produced daily with a minimum amount of labor. Notes on the biology of the leaf roller in the laboratory are given.

122. Gudmund Taksdal and D. Pimentel. Tarnished plant bugs oviposited as readily on radish as on bean plants, but development on radish was poor. Significant differences in tarnished plant bug resistance were found among bean varieties. Tarnished plant bug preferences were influenced partly by the plant on which they were raised.

123. D. Pimentel. The ecological relationship of the 208 taxa which make up the *Brassica oleracea* L. (Cruciferae) community was investigated. Special consideration was given the question of interspecific competition and the species per genus structure of communities—why 63% of the species in this community were members of a genus represented by one species; 21% were members of a genus with two species; 12% were members of a genus with three species; and 4% were members of a genus with four species?

124. J. J. Cartier. *A. pisum* cultures originating from alfalfa and reared on peas develop faster and produce more and larger individuals than others originating from red clover. The host specificity of certain biotypes has brought a new theory on the mechanisms of the migration of the pea aphid.

125. W. L. Freeman. When radishes were grown on compost-treated, fertilizer-treated, and infertile soils, the diamondback moth, *Plutella maculipennis* Curtis, and the green peach aphid, *Myzus persicae* (Sulz.), showed marked differences in their preferences for the plants and in their life histories when confined on the differently treated plants.

126. M. H. Farrier and Alva L. Finkner. Rural occupied dwelling units were randomly selected. Sixteen percent had no gardens. Thirty kinds of vegetables, 10 brands and 8 kinds of insecticide were being used. Cabbage, rotenone and 3 brands of insecticide were the most popular. Methods of loss estimation will be discussed with foliage loss of snap beans as an example.

127. J. L. Jarvis, T. R. Everett, T. A. Brindley, and F. F. Dicke. Yield reduction by European corn borer populations was evaluated by determining numbers of larvae, leaf lesions, and cavities. Lesions were a better damage index than larvae. The best index was cavities. Cavities found in split stalks were as good as cavities found in dissected stalks in determining borer damage.

128. E. F. Taschenberg. Records will be presented on abundance of Phylloxera, *Phyllozera vitifoliae*, Fitch, in commercial Concord vineyards along with some observations on the distribution of the pest on the root system and activity on this variety.

129. E. H. Smith. Female plum curculio, provided drinking water and held at 80% RH, lived 281 days producing 829 eggs compared with 50 days and 337 eggs at 20% RH and without water. Striking differences were shown in water requirements of single-brooded and multi-brooded strains.

130. E. R. Oatman. Larval development was recorded at weekly intervals from the dormant stage in overwintering hibernaculae to the formation of "nests" on terminal foliage. One-hundred percent of the terminals were infested; 92 percent of the fruit buds were injured; and 86 percent of the pistils were destroyed in an orchard within one week following petal fall.

131. R. O. Paradis. Mean densities, with biometric precision limits, were determined for immature stages of *A. argyrospila*, and related mortality factors, 1957–60 generations. The data interpreted by means of life tables revealed mortalities for eggs to result mainly from desiccation; instars I-II, dispersal; instars III-V, bird predation; pupae, parasitism.

SUB-SECTION C-d. (Continued)

132. S. G. Turnipseed and R. L. Rabb. In *Conoderus vespertinus* frequency of mating influences oviposition pattern and egg viability. Adults show definite oviposition responses in relation to temperature, soil moisture and soil type. Quantity and quality of food available to adults influence number of eggs laid. Data on length of pre-oviposition period, depth of oviposition and other factors are also presented.

133. B. H. Wilford. Observed fluctuations in outbreak intensities of the spruce budworm, *Choristoneura fumiferana* (Clem.) from 1930 to 1960 in the favored host types of the Central Rocky Mountains offer interesting examples of ecology as concerns natural control in action and incidental but real effects on human welfare.

134. Dean L. Haynes and James W. Butcher. Head capsule width, body length and dry weight are evaluated singly and in various combinations in order to estimate their usefulness in portraying seasonal growth and development of European pine shoot moth larvae.

135. Walter L. Jones and Dwight M. DeLong. *Aedes aegypti* larvae were reared aseptically to the pupal stage at different population densities. Data on the following variables: per cent pupation, body size, male-female ratio, fecundity, and hatchability were obtained. Results indicate decreased adult emergence, fecundity, and longevity with overcrowded conditions.

136. A. R. Barr and B. Rosay. Broods of *A. nigromaculis* were studied from the emergence of the adults until all had died. The populations were sampled daily by several different methods. The adults were dissected and their physiological states and ages tabulated. A summary of the history of such a brood is given.

137. J. Chao. *C. tarsalis* pupae were segregated and wings were removed from the emerged adults. The biology of the cohabitating dewinged adults of either sex was not different from controls except in mating, which apparently had not taken place, since eggs laid by females after a blood meal were not fertile.

138. Roger Meola and Dwight M. DeLong. The confinement of *Aedes aegypti* larvae and pupae to inverted glass containers in which the air-water interface faces downward rather than upward is under investigation. Some preliminary observations on behavior, survival and feeding are discussed. The resulting adults are also considered.

139. J. Chao. Eggs of *C. p. pipiens, C. quinquefasciatus, C. tarsalis, An. albimanus,* and *Ae. sierrensis* were surface sterilized with 80 per cent ethanol and inoculated into thioglycollate broth. Some larvae hatched and molted once after a prolonged first instar. But no microorganisms were found in the broth.

140. Chad M. Murvosh. A comparative study was made of the physical, chemical, and biological factors of riffle and run habitats in a small stream in central Ohio. The results indicate that water turbulence was the dominant factor which produced an abundance of microhabitats in the riffle.

141. D. Robert Brebbia. An analysis of the sodium, potassium and calcium ions as well as osmotic pressures of larval, pupal and adult haemolymph will be presented.

A solution with ion ratios of Na/K = 30 and K/Ca = 2, and osmotically equivalent to 1.4% NaCl is required for 24 hour maintenance of adult heartbeats.

142. G. K. Bracken, Wm. Hanec and A. J. Thorsteinson. The wavelength and reflectance of different colors, and the shape of the silhouette influence the orientation of *Tabanus* species. The most attractive objects are spherical or cylindrical in form and whose surface is of low reflectance.

143. Gene D. Amman. Observations of the seasonal biology of the balsam woolly aphid, *Chermes piceae* (Ratz.), made on Fraser fir in the Mt. Mitchell area of North Carolina indicated the aphid may have as many as four generations per year. However, only a portion of the population passed through the third and fourth generations.

144. Roy L. Edwards. Grasshopper outbreaks in Saskatchewan have been correlated with preceding weather conditions. Using this relationship a method of forecasting that promises to be more accurate than the present "survey" method has been developed.

SECTION D. Medical and Veterinary Entomology

145. Cluff E. Hopla. For the past twelve years cricetid rodents and their nests have been collected in order to study the flea populations involved. The data obtained from this study revealed that certain concepts regarding the host specificity of *Epitedia wenmanni* and *Orchopeas leucopus,* as well as other species, must be revised.

146. R. O. Hayes, L. D. Beadle, L. C. LaMotte, A. D. Hess, O. Sussman and M. J. Bonese. Entomological aspects of the 1959 outbreak of eastern encephalitis in New Jersey. There appears to be a correlation between the types of mosquitoes which were the most abundant in the inland and coastal regions and the types of hosts stricken in these regions.

147. Don W. Micks. The susceptibility of the larvae of a number of field-collected strains of *Aedes sollicitans, Aedes taeniorhynchus* and *Culex fatigans* to DDT, BHC and dieldrin was determined with the standard WHO test kit. Adults reared from larval collections were also tested for DDT and dieldrin susceptibility. The insecticide-resistance levels in the larvae and corresponding adults will be discussed.

148. Andrew J. Rogers. Extensive soil sampling showed that significant sand fly (Culicoides) production is limited to the narrow peripheral areas of Florida salt marshes that are filled or impounded for mosquito control.

149. J. E. Tullis and D. M. DeLong. Reciprocal, single-pair matings between strains of *Aedes aegypti* differing in male:female ratio were made. Backcross and F_2 generations were produced. Different results concerning the male: female ratio were obtained from the reciprocal matings. The possibility of extranuclear influence is suggested.

150. R. F. Harwood. Attraction is by means of light, moving visual pattern, or animal odor. A turntable modification for host preference studies is also incorporated. Timed-interval trapping permits breakdown of insect activity during a 24 hour cycle.

151. Mir S. Mulla, George P. Georghiou and Harry W. Cramer, Jr. Thirty insecticides, a majority of them organophosphates, were evaluated at 3 dosage levels as soil treatments. Treated soil samples were aged at 90° F. and evaluated for activity at 2-, 4-, and 8-month intervals. Ethion, GC-4072, Ethyl Guthion, Trithion, Diazinon and Bayer 25141 manifested long residual activity. Others tested, indicated little to moderate residual activity in soil.

152. R. H. Roberts and O. H. Graham. The repellent action of a standard 0.1% pyrethrins plus 1.0% piperonyl butoxide spray in oil was compared with the repellency of a number of oil sprays containing various substituted or added repellents and synergists against biting fly attack in standardized laboratory tests.

153. G. C. LaBrecque, J. B. Gahan, and C. R. Crittenden. Three compounds administered in the food of adult *Musca domestica* L. caused sterility of both sexes. They stunted ovarian development but did not destroy sperm motility. An infestation of flies that had access to a diet containing hexakis(1-aziridinyl)-phosphonitrilate oviposited normally but was eliminated by the F_2 generation.

SECTION D. (Continued)

154. M. Sherman and E. Ross. Toxicity to house fly, *Musca domestica* (L.), larvae of manure from chicks given insecticides in feed and water was determined. Of 22 insecticides studied, the following resulted in greater than 90% larval mortality: Dimethoate, 44 p.p.m.; Bayer 22408, 22 p.p.m.; Bayer 29493, 220 p.p.m.; Am. Cyan. 18706, 220 p.p.m.; and Am. Cyan. 12008, 110 p.p.m.

155. John W. Kilpatrick and H. F. Schoof. Field evaluations of residual applications of Bayer Compounds 29493 and 22408, DDVP, and Dimethoate have shown that 100 mg./sq ft of Bayer Compound 29493 or Dimethoate provided 6 to 10 weeks of satisfactory control of house fly populations. Bayer Compound 22408 and DDVP provided a much lower level of control.

156. John W. Kilpatrick and Darrell R. Maddock. A one-quart chicken-watering device fitted with a cellulose sponge in the cup of the dispenser was found very satisfactory for dispensing liquid poison baits. Quart jars containing 25 percent DDVP as a solid formulation and refilled with 10 percent sugar water bi-weekly produced excellent fly control in animal shelters.

157. Wm. M. Rogoff and P. H. Kohler. Control of the horn fly, *Siphona irritans* (L.), comparable to spraying, was obtained by pouring 100 ml. of aqueous emulsions of Ruelene or toxaphene on the backs of cattle. Mixtures used contained approximately the same quantity of insecticide as would be applied during routine spray operations.

158. Neal O. Morgan. *S. irritans* adults have been observed migrating to different areas of bovine bodies according to prevailing weather conditions. Observed temperature and humidity variations indicate the presence of a microclimatic envelope of approximately one quarter inch deep about an animals body.

159. R. O. Drummond and O. H. Graham. Small numbers of calves were treated dermally with 50–250 ml. of mineral oil containing 2%–4% Co-Ral (*O*-(3-chloro-4-methylumbelliferone) *O,O*-diethyl phosphorothioate). Others were injected intramuscularly at 5 and 10 mg/kg with Co-Ral suspended in peanut oil or dissolved in diethyl succinate. All treatments except one were 98%–100% effective in systemically controlling cattle grubs (*Hypoderma lineatum* (DeVill)).

160. D. E. Johnston. The Ixodorhynchines are ectoparasites of crotalid and colubrid snakes. Four species are known from N. A. (3 *Ixodorhynchus*, 1 *Hemilaelaps*). The author's studies on the life cycle (consisting of larva, 2 nymphs and adult) and systematics (with preliminary remarks on geographic variation) of these mites will be summarized.

161. Clyde S. Barnhart, Sr. Agricultural type insecticide dispersal equipment is too heavy and cumbersome for use in a Theatre of Operations. New equipment is under development with a marked increase in capability per pound. Decrease in weight and horsepower and increased acreage capability is built into the same machine.

162. E. Benjamini, Ben F. Feingold and L. Kartman. Direct experimental proof demonstrated that hypersensitivity of guinea pigs to flea bites was induced by injection of the *in vitro* collected oral secretion of the cat flea, *Ctenocephalides felis felis* (Bouché), in combination with various adjuvants, while no such induction was achieved when the oral secretion was injected alone.

163. D. W. Jenkins. Over 65 human cases of tick paralysis in eastern United States have been caused by *Dermacentor variabilis*, *Amblyomma americanum* and *A. maculatum*. Epidemiological data are presented and distribution maps correlate the cases with the tick distribution. Paralysis of dogs and other animals in this area is discussed.

164. Byron Williamson and Richard N. Lyness. Adult female engorged brown dog ticks, *Rhipicephalus sanguineus* (Latr.), were dipped in and collected from dogs dipped in Sevin water emulsions. Using as the criterion of death the inability to move out of 15-mm. circles in 2 hours, Sevin was the most effective insecticide tested.

165. K. L. Knight, D. W. Bryan and C. W. Taylor. A screening method was developed for testing effect of chemicals upon force required to detach feeding *A. americanum* adults from rabbits' ears. Pull required to remove male specimens was found to differ significantly from those required for detachment of females. Formulations of pyrethrins were most successful of those tried.

166. Tien-Hsi Cheng, Henry F. Enos, Jr. and Donald E. H. Frear. Sprays containing dimethoate (0,0,dimethyl S(N-methylcarbamoylmethyl) phosphorodithioate) and R-1207 (3-chloropropyl *n*-octyl sulfoxide) gave effective control of biting flies on cattle and in dairy barns. Aerosol formulations applied by means of a new automatic aerosol spraying device provided excellent protection against the horn fly, but less consistent control of the stable fly and face fly (*Musca autumnalis* Deg.).

Analyses of milk taken from treated cows and made by a new chromatographic procedure showed no detectable residues as of this date.

SECTION F. Chemical Control

168. Marvin L. Bobb. Randomized single-tree plots, consisting of from 8 to 12 replicates within a 6-acre block of peach trees, were sprayed with several different insecticides for control of *Synanthedon pectipes*. Thiodan, endrin, Sevin and dieldrin were the most effective of the insecticides tested.

169. R. G. Strong and D. L. Lindgren. Results from studies indicate the effect of atmospheric fumigation with hydrocyanic acid, hydrogen phosphide, and methyl bromide on the germination of seeds.

170. Ernesto Doreste S. An account is given of the history and economic status of mites of agricultural importance in Central Venezuela. The principal species injurious to citrus, potatoes, eggplant, and bananas are briefly treated and control experiments and field trials with certain chemicals are described. A list of mites of economic importance on 16 crops is given.

171. Dean Asquith. For three seasons, three methods of using acaricides were tested against the European red mite on apple. In the third season, control data showed that two of the methods of use delayed the selection of strains of the mites resistant to the acaricides in the test.

172. R. W. Dean. Laboratory tests of the toxicity of recently-developed insecticides to the adult stage of the apple maggot, *Rhagoletis pomonella* Walsh, are described, together with the results of foliar spray applications of the more promising materials under orchard conditions.

173. G. A. Schaefers. Population studies on *Steneotarsonemus pallidus* Banks revealed a rapid increase in late May, peaking in early July and then gradually declining. Of 18 materials tested for control, Thiodan, endrin, and SD 4402 were most effective. Late August treatment during the planting year effectively suppresses mites through first fruiting period.

174. H. E. Osburg and E. D. Goldsmith. Several salicylate compounds added to the medium fed fruit-fly larvae enhance the effectiveness of the anti-folics in decreasing the adult emergence values. Background material, mechanism of drug action and significance will be discussed.

175. H. H. Shorey. Sevin alone and in combination with various ratios of 2 synergists was evaluated in the laboratory against larvae of the cabbage looper, *Trichoplusia ni* (Hbn.). Addition of either piperonyl butoxide or Monsanto 16226 caused an approximately 10-fold increase in the toxicity of Sevin at the level of the LD_{50}.

176. Elvin W. Tilton. A unique method of fumigating milled rice with hydrogen cyanide in which a high dosage of gas is introduced into stacks of rice covered with plastic film has been developed. A high percentage of the cyanide is sorbed by the rice and slowly released to provide continuous fumigations for several months.

177. Dan F. Clower. The results of a four-year study of insect species injurious to grain sorghum in the field is presented. Cultural and chemical methods of combatting these pests received the greatest emphasis in this work. The most important insect pests of this crop in Louisiana were found to be 5 species of Lepidopterous larvae and 1 Diptera.

178. W. V. Campbell and T. G. Bowery. Granular heptachlor applied at three locations in the fall resulted in near perfect control of the alfalfa weevil by preventing the establishment of adults. Alfalfa treated in October showed no detectible residues of heptachlor or its epoxide on the first cutting in May.

179. C. S. Koehler and George G. Gyrisco. Trials in which insecticides were applied up to 3 times during the growing season indicated that clover longevity and yield were not correlated with degree of *H. obscurus* control. Soil type and moisture had a greater influence than borer infestation on yield. Longevity was not influenced by these 3 factors.

180. Dale M. Norris, Jr. A hollow metal projectile to contain systemic insecticides and inject such materials into the vascular system of trees has been developed and tested under field conditions. Specific considerations regarding the nature, dimensions, and functions of the projectile and its propellence into the tree will be discussed.

181. Harry C. Coppel and Dale M. Norris, Jr. White pine trees were injected with phosphate compounds to test their systemic insecticidal action against the introduced pine sawfly. Bioassays were conducted at various intervals after treatment. Results further indicate that such systemics give practical insect control for extended periods after treatment.

182. R. L. Lyon. Research is aimed at developing bark-surface deposits of residual insecticides having long-lasting effectiveness. Certain types of deposits proved more toxic than others. Microscopic structure of deposit crystals affects toxicity. Some of the causes for various types of crystal structure have been isolated.

183. W. B. Becker and H. G. Abbott. An October application of a 0.4 per cent gamma isomer content BHC emulsion in Massachusetts protected logs from autumn-felled eastern white pines against damage by wood boring insects the following spring. Decked logs were sprayed as a unit.

184. R. G. Strong and D. E. Sbur. Several variables were considered in a series of laboratory studies on the influence of storage conditions on the effectiveness of malathion as a grain protectant. The results indicate conditions which may prolong or decrease the residual value of malathion on grain.

185. B. W. Clements, Jr., H. B. Gillenwater and M. F. Phillips. Malathion wettable powder was applied to all surfaces of stacks of citrus pulp in burlap bags to determine effectiveness in preventing infestation by stored-product insects. Monthly applications of 50 mg./sq. ft. malathion provided almost complete protection. Residues were measured on the bag surfaces, and the feed in sprayed and interior bags.

186. Dean F. Davis and Richard H. Guy. Review of preliminary laboratory repellency evaluation tests of more than 1,000 chemicals reveals that imide compounds constitute the major single group of chemicals showing the greatest promise. The most effective imides are listed and repellency data for *Tribolium* spp. presented. Imide compounds also have shown repellency to rodents in Fish and Wildlife Service evaluation tests.

187. R. A. Morse. In the spring of 1960 the Plant Pest Control Division of the USDA sprayed about 10,000 acres by air in N. Y. Colonies were placed in spray areas and observations made in commercial apiaries. The formulation was more toxic than that previously observed. Despite the loss of a large number of bees, recoveries were good.

188. Mir S. Mulla and Harold Axelrod. Fundamental aspects of coated and impregnated granular formulations of parathion were studied. Solvents used for impregnation, carriers, and toxicant concentration and rate of application were found to influence the rate of release of parathion into water. By proper selection of the ingredients, rapid and slow releasing formulations were prepared.

189. P. R. Sferra, F. L. Gambrell and G. L. Mack. Pesticide residue analyses using chemical and biological methods were conducted on soil from nursery plantings. Results obtained from Drosophila adult and European chafer larva bioassays and chemical techniques will be compared.

190. Roy T. Cunningham, J. L. Brann, Jr. and Glenn A. Fleming. Evaporation losses may reduce the size of the droplets so that they lack sufficient momentum for impingement. Losses from an airblast spray were measured by determining the increase in concentration of a chemical dissolved in the spray water. Losses were correlated with the spray "fineness," distance traveled, and ambient wet-bulb depression.

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CHEMICAL CONTROL AND CONSERVATION

The National Academy of Sciences and the National Research Council has announced the formation of a new committee to investigate the relationship between chemical control of agricultural pests and conservation of American wildlife. In the light of events of the last year, the need for dispassionate and intelligent consideration of this relationship is evident. The membership of the committee, which is given below, is one to inspire confidence and assurance of responsible judgment.

The members of the new committee are: *Chairman*, Dr. Ira L. Baldwin, special assistant to the president of the University of Wisconsin; Dr. Ira N. Gabrielson, president of the Wildlife Management Institute; Dr. Tom H. Gill, executive director of the Charles Lathrop Pack Forestry Foundation; Dr. George L. McNew, managing director of Boyce Thompson Institute; Dr. E. C. Young, professor of economics and dean of the graduate school, Purdue University; and Dr. G. C. Decker, entomologist, Illinois Natural History Survey. Dr. W. H. Larrimer of the Academy-Research Council will serve as the executive secretary of the Committee. The latter two are members of the Entomological Society of America.

NECROLOGY

BASHOR, EUGENE F. 53. Commercial entomologist. By accident in San Francisco, California. April 26, 1960.

CAFFREY, DONALD J. 73. Retired U. S. Department of Agriculture economic entomologist. Emeritus member with 48 years of membership. At his summer home in Traverse City, Michigan. June 22, 1960.

CLARK, EDWIN C. 38. Forest entomologist and insect pathologist. In Moscow, Idaho. May 23, 1960.

FREEBORN, STANLEY B. 68. Chancellor Emeritus, University of California. Retired teacher. Forty-two year member, Fellow in the former Entomological Society of America. *Chairman*, 1960 Committee on Professional Training, Standards and Status. At his home in Woodland, California. July 17, 1960.

KAUFFMAN, WILLIAM. 57. Economic entomologist. At his home in Tucson, Arizona. March 25, 1959.

KULASH, WALTER M. 48. Teacher and economic entomologist. At his home in Raleigh, North Carolina. September 18, 1960.

MANN, WILLIAM M. 74. Retired Zoo Director and entomologist. Forty-seven-year member. Fellow in the former Entomological Society of America and life member. At his home in Washington, D. C. October 10, 1960.

MOORE, WARREN. 67. Retired consulting entomologist, insecticide specialist. At his home in Raphine, Virginia. June 11, 1960.

RENK, ALICE V. 51. U. S. Department of Agriculture entomologist. At the Washington Hospital Center, Washington, D. C. August 15, 1960.

SAUNDERS, W. B. 68. Economic entomologist of Hollister, California. In Salinas, California. October 16, 1959.

SCHWARZ, HERBERT F. 77. Taxonomic entomologist, authority on Hymenoptera. Thirty-one-year member. Fellow in the former Entomological Society of America. At his home in New York City. October 2, 1960.

SHEALS, RALPH A. 67. Retired Assistant Chief, Bureau of Entomology and Plant Quarantine, U. S. Department of Agriculture. At his home in St. Petersburg, Florida. October 1, 1960.

AMERICAN INSTITUTE OF BIOLOGICAL SCIENCES TRANSLATION PROGRAM

The American Institute of Biological Sciences is currently translating and publishing seven Russian research journals in biology. These journals are translated with support from the National Science Foundation, which is eager that such information be more widely distributed to biologists throughout the world. It is hoped that this material will aid biologists in research, prevent duplication of work, give some idea of the work being done by Soviet scientists in the field of biology, and also bring about a better international understanding among scientists.

Because of the support of the National Science Foundation, the AIBS can offer these translations at a fraction of their publication cost, with even further price reduction to AIBS members and to academic and non-profit libraries. This reduction, the AIBS feels, places the translation within the reach of all biologists.

The journals currently being translated are: Doklady: Biological Sciences Section; Doklady: Botanical Sciences Section; Doklady: Biochemistry Section; Plant Physiology; Microbiology; Soviet Soil Science; and Entomological Review.

In addition to its program of Russian Biological Journal translations, the AIBS has instituted a separate program of translation and publication of selected Russian Monographs in biology.

It was felt that the program of Journal translations was not sufficient to cover all of the significant work being done in all fields of biology by Russian scientists. With the aid of competent authorities, the AIBS has translated and published six Russian monographs and one monograph is in the process of being published. In addition, several prominent monographs in various biological areas are being considered by the AIBS and the National Science Foundation for translation and publication. The monographs that have been published are: Origins of Angiospermous Plants by A. L. Takhtajan; Problems in the Classification of Antagonists of Actinomycetes by G. F. Gauze; Marine Biology, Trudi Institute of Oceanology, Vol. XX, edited by B. N. Nikitin; Arachnoidea by A. A. Zakhvatkin; and Arachnida by B. I. Pomerantzev. The manuscript for Plants and X rays by L. P. Breslavets is in the final stages of preparation and should be published early in 1960.

Additional information pertaining to this program may be obtained by writing to the American Institute of Biological Sciences, 2000 P Street, N.W., Washington 6, D. C., U. S. A.

EASTERN BRANCH MEETING

Announcements have been mailed regarding the 1960 meeting of the Eastern Branch of this Society on October 27 and 28. See under *Meetings*. J. Peter Johnson will be chairman of a special section on Insects of Shade Trees and Ornamentals. He advises that there was some Smith trouble and that the speaker for his section listed as Clyde Smith should be Floyd F. Smith.

GIFT OF VAN DUZEE LIBRARY

On the 100th Anniversary of the birth of Millard Carr Van Duzee, the Research Library of the Buffalo Museum of Science, Humboldt Park, Buffalo 11, New York, was presented with his entomological library and available reprints. The library has duplicate reprints of many titles and for postage will fill requests from qualified entomologists. The address of the library is given above.

LISTING OF BRANCH AND REGIONAL ENTOMOLOGICAL MEETINGS

By M. P. JONES[1]

I. ENTOMOLOGICAL SOCIETY OF AMERICA

Pacific Branch Meetings

Meeting	*Year*	*Place*	*Chairman*	*Secretary-Treasurer*
1	1916	San Diego, Calif.	E. D. Ball (H. J. Quayle)	E. O. Essig
2	1917	Stanford, Calif.	A. W. Morrill	"
3	1918	Riverside, Calif.	G. P. Weldon	"
4	1919	Riverside, Calif.	H. J. Quayle	"
5	1920	Seattle, Wash.	E. M. Ehrhorn (A. L. Melander)	"
6	1921	Berkeley, Calif.	E. O. Essig	A. L. Lovett
7	1922	Salt Lake City, Utah	A. L. Lovett	E. O. Essig
8	1923	Los Angeles, Calif.	H. J. Quayle	"
9	1924	Stanford, Calif.	H. S. Smith	R. E. Campbell
10	1925	Portland, Ore.	L. Childs	"
11	1926	Oakland, Calif.	W. B. Herms	"
12	1927	Reno, Nevada	R. W. Doane	"
13	1928	Claremont, Calif.	R. S. Woglum	"
14	1929	Berkeley, Calif.	O. H. Swezey	"
15	1930	Eugene, Ore.	D. C. Mote	"
16	1931	Pasadena, Calif.	R. E. Campbell	H. A. Scullen
17	1932	Pullman, Wash.	G. M. List	"
18	1933	Salt Lake City, Utah	R. L. Webster	"
19	1934	Berkeley, Calif	G. I. Reeves	"
20	1935	Los Angeles, Calif.	H. E. Burke (R. E. Campbell)	"
21	1936	Seattle, Wash.	H. A. Scullen	J. F. Lamiman
22	1937	Denver, Colo.	E. J. Newcomer	"
23	1938	San Diego, Calif.	J. R. Eyer	"
24	1939	Stanford, Calif.	R. H. Smith	"
25	1940	Seattle, Wash.	B. G. Thompson	"
26	1941	Pasadena, Calif.	A. M. Boyce	R. E. Campbell
27	1942	Salt Lake City, Utah	G. F. Knowlton	"
28	1943	Corvallis, Ore.	M. C. Lane	"
29	1944	Berkeley, Calif.	A. J. Flebut	"
	1945	(no meeting)		
30	1946	Riverside, Calif.	H. J. Ryan	"
31	1947	Berkeley, Calif.	M. A. Stewart	"
32	1948	Vancouver, B. C.	W. J. O'Neill	"
33	1949	Grand Canyon, Ariz.	J. N. Roney	"
34	1950	Santa Cruz, Calif.	H. M. Armitage	"
35	1951	Seattle, Wash.	E. H. Littooy	L. M. Smith
36	1952	Santa Barbara, Calif.	G. E. Carman	"
37	1953	Lake Tahoe, Calif.	S. F. Bailey	"
38	1954	Bend, Ore.	S. B. Freeborn	"
39	1955	Riverside, Calif.	J. B. Steinweden	"
40	1956	Berkeley, Calif.	W. Carter	"
41	1957	Portland, Ore.	L. G. Gentner	H. H. Keifer
42	1958	San Diego, Calif.	L. S. Jones	"
43	1959	Sacramento, Calif.	L. M. Smith	"
44	1960	Spokane, Wash.	H. C. Manis	"

North Central Branch Meetings

(FORMERLY NORTH CENTRAL STATES ENTOMOLOGISTS)

Meeting	*Year*	*Place*	*Chairman*	*Secretary-Treasurer*
1	1921	Lafayette, Ind.	S. A. Forbes	J. J. Davis
2	1922	No meeting		
3	1923	Urbana, Ill.	W. P. Flint	"
4	1924	Columbus, Ohio	H. A. Gossard	T. H. Parks
5	1925	Lafayette, Ind.	J. J. Davis	W. P. Flint
6	1926	Urbana, Ill.	J. W. McColloch	T. H. Fryson
7	1927	Madison, Wisc.	S. B. Fracker	D. M. DeLong
8	1928	St. Louis, Mo.	A. F. Satterthwaite	K. C. Sullivan
9	1929	E. Lansing, Mich.	?	?
10	1930	Lafayette, Ind.	J. J. Davis	?
11	1931	Urbana, Ill.	W. P. Flint	T. H. Frison
12	1932	Wooster, Ohio	J. S. Houser	L. L. Huber
13	1933	St. Louis, Mo.	A. F. Satterthwaite	?

[1] Compiled with the assistance of numerous entomologists in the various organizations.

North Central Branch (Continued)

Meeting	*Year*	*Place*	*Chairman*	*Secretary-Treasurer*
14	1934	Lafayette, Ind.	J. J. Davis	W. B. Noble
15	1935	Urbana, Ill.	W. P. Flint	?
16	1936	Ames, Iowa	C. J. Drake	?
17	1937	Kansas City, Mo.	G. A. Dean	?
18	1938	Columbus, Ohio	T. H. Parks	?
19	1939	St. Paul, Minn.	A. G. Ruggles	?
20	1940	Lafayette, Ind.	J. J. Davis	?
21	1941	Columbia, Mo.	L. Haseman	?
22	1942	Urbana, Ill.	W. P. Flint	?
23	1943	Lafayette, Ind.	J. J. Davis	?
24	1944	Urbana, Ill.	C. L. Metcalf	?
25	1945	Lafayette, Ind.	G. C. Decker	?
26	1946	St. Louis, Mo.	J. J. Davis	M. D. Farrar
		Became North Central Branch		
27	1947	Des Moines, Iowa	J. S. Houser	J. W. Apple
28	1948	Peoria, Ill.	G. C. Decker	"
29	1949	Milwaukee, Wisc.	F. N. Wallace	"
30	1950	Kansas City, Mo.	G. M. List	"
31	1951	Toledo, Ohio	C. R. Neiswandes	"
32	1952	St. Paul, Minn.	R. C. Smith	"
33	1953	St. Louis, Mo.	T. H. Parks	"
34	1954	Omaha, Nebr.	G. C. Decker	Roy Rings
35	1955	E. Lansing, Mich.	T. C. Allen	"
36	1956	Lafayette, Ind.	H. Gunderson	"
37	1957	Des Moines, Iowa	C. E. Mickel	Curtis Wingo
38	1958	St. Louis, Mo.	D. A. Wilbur	"
39	1959	Columbus, Ohio	R. E. Hill	"
40	1960	Milwaukee, Wisc.	J. W. Apple	Gordon Guyer

Southeastern Branch Meetings

(Formerly Cotton States Branch)

Meeting	*Year*	*Place*	*Chairman*	*Secretary-Treasurer*
1	1926	Atlanta, Ga.	W. E. Hinds	G. M. Bentley
2	1927	Atlanta, Ga.	F. Sherman	"
3	1928	Memphis, Tenn.	G. M. Bentley	O. I. Snapp
4	1929	Houston, Tex.	F. L. Thomas	"
5	1930	Jackson, Miss.	B. R. Coad	"
6	1931	Atlanta, Ga.	J. M. Robinson	"
7	1932	Birmingham, Ala.	R. W. Harned	"
8	1933	New Orleans, La.	J. W. Folsom	"
9	1934	Memphis, Tenn.	R. W. Leiby	"
10	1935	Atlanta, Ga.	S. W. Bilsing	
11	1936	Jackson, Miss.	C. Lyle	"
12	1937	San Antonio, Tex.	W. E. Anderson	"
13	1938	New Orleans, La.	W. E. Dove	"
14	1939	Tampa, Fla.	C. O. Eddy	"
15	1940	Birmingham, Ala.	O. I. Snapp	J. T. Creighton
16	1941	Waco, Tex.	Z. P. Metcalf	"
17	1942	Memphis, Tenn.	F. A. Fenton	"
18	1943	None (war period)	O. W. Rosewall	"
War Conference	1944	New Orleans, La.	O. W. Rosewall	"
19	1945	New Orleans, La.	E. W. Laake	"
20	1946	Dallas, Tex.	C. E. Smith	"
21	1947	Biloxi, Miss.	R. C. Gaines	"
22	1948	Atlanta, Ga.	D. Isely	"
23	1949	Baton Rouge, La.	J. T. Creighton	K. P. Ewing
24	1950	Tampa, Fla.	E. W. Dunnam	"
25	1951	Memphis, Tenn.	J. W. Ingram	"
26	1952	Atlanta, Ga.	C. A. Alden	L. C. Murphree
27	1953	New Orleans, La.	K. Cockerham	"
28	1954	Biloxi, Miss.	F. S. Arant	"
29	1955	Tampa, Fla.	W. G. Bruce	W. G. Eden
30	1956	Atlanta, Ga.	H. C. Young	"
31	1957	Birmingham, Ala.	A. N. Tissot	"
32	1958	Memphis, Tenn.	N. Allen	M. E. Merkl
33	1959	Memphis, Tenn.	C. Lincoln	"
34	1960	Savannah, Ga.	F. E. Guyton	"

Eastern Branch Meetings

Meeting	*Year*	*Place*	*Chairman*	*Secretary-Treasurer*
1	1929	New York N. Y.	E. N. Cory	H. B. Weiss
2	1930	New York, N. Y.	C. H. Hadley	"
			P. J. Parrott (acting)	
3	1931	New York, N. Y.	W. J. Schoene	"
4	1932	Atlantic City, N. J.	L. M. Peairs	"
5	1933	Philadelphia, Pa.	T. J. Headlee	"
6	1934	New York, N. Y.	L. A. Stearns	"
7	1935	Baltimore, Md.	B. A. Porter	"
8	1936	New York, N. Y.	P. Garman	"
9	1937	Philadelphia, Pa.	H. N. Worthley	"
10	1938	Baltimore, Md.	V. I. Safro	"
11	1939	New York, N. Y.	C. C. Hamilton	"
12	1940	Atlantic City, N. J.	W. H. White	"
13	1941	Baltimore, Md.	J. L. Horsfall	"
14	1942	New York, N. Y.	W. S. Hough	"
15	1943	Philadelphia.	M. P. Jones	"
	1944	No meeting (war period)		
16	1945	New York, N. Y.	H. Glasgow	B. F. Driggers
17	1946	Baltimore, Md.	H. F. Dietz	"
18	1947	Philadelphia, Pa.	J. O. Pepper	"
19	1948	New York, N. Y.	C. M. Packard	"
20	1949	Baltimore, Md.	F. C. Nelson	"
21	1950	Philadelphia, Pa.	E. Gould	"
22	1951	New York, N. Y.	F. H. Lathrop	"
23	1952	Baltimore, Md.	F. F. Smith	"
24	1953	Philadelphia, Pa.	P. J. Chapman	"
25	1954	New York, N. Y.	H. G. Walker	"
26	1955	Baltimore, Md.	E. H. Wheeler	"
27	1956	Atlantic City, N. J.	F. W. Poos	"
28	1957	New York, N. Y.	C. C. Alexander	"
29	1958	Baltimore, Md.	N. Turner	L. G. Merrill, Jr.
30	1959	Atlantic City, N. J.	R. I. Sailer	"
31	1960	New York, N. Y.	E. N. Woodbury	"

Southwestern Branch Meetings

Meeting	*Year*	*Place*	*Chairman*	*Secretary-Treasurer*
1	1951	Dallas, Tex.	H. G. Johnston	Sherman Clark
2	1952	San Antonio, Tex.	R. C. Bushland	"
3	1953	Galveston, Tex.	P. J. Reno	"
4	1954	Dallas, Tex.	D. E. Howell	"
5	1955	Houston, Tex.	J. M. Landrum	"
6	1956	Fort Worth, Tex.	D. L. Earley	"
7	1957	San Antonio	J. C. Gaines	"
8	1958	Houston, Tex.	C. R. Parencia	"
9	1959	Dallas, Tex.	P. Gregg	H. E. Meadows
10	1960	El Paso, Tex.	C. Bower	"

II. REGIONAL ENTOMOLOGICAL GROUPS

Meetings of International Great Plains Congress of Entomologists

Meeting	*Year*	*Place*	*Chairman*	*Secretary*
1	1921	Regina, Sask.	N. Criddle	M. P. Tullis
2	1922	Minot, N. D.	"	Stewart Lockwood
3	1923	Winnipeg, Man.	"	A. V. Mitchner
4	1924	Bozeman, Mont.	"	J. R. Parker
5	1925	St. Paul, Minn.	"	A. G. Ruggles
6	1926	Lethbridge, Alta.	"	H. L. Seamans
7	1927	Saskatoon, Sask.	"	Kenneth King
8	1928	Fargo, N. D.	"	J. A. Munro
9	1929	Treesbank, Alta.	"	Norman Criddle
10	1930	Blairmore, Alta.	"	H. L. Seamans
11	1931	Bozeman, Mont.	"	A. L. Strand
12	1932	Edmonton, Alta.	"	E. A. Strickland
13	1933	Regina, Saks.	"	Kenneth King
14	1934	Lake Itasca, Minn.	"	A. G. Ruggles
15	1935	State Game Lodge, S. D.	"	H. C. Severin
16	1936	Brandon, Man.	"	R. D. Bird
17	1937	Bozeman, Mont.	"	A. L. Strand
18	1938	Swift Current, Sask.	T. L. Aamodt	Kenneth King
19	1939	St. Paul, Minn.	A. G. Ruggles	A. G. Ruggles
20	1940–45	No meetings		

International Great Plains Congress (Continued)

Meeting	*Year*	*Place*	*Chairman*	*Secretary*
21	1946	Waterton Lakes, Alta.	C. E. Mickel	George Manson
22	1947	Hamilton & Missoula, Mont.	"	C. B. Philip
23	1948	Riding Mt. National Park, Man.	"	R. R. Lejeune
24	1949	Laramie, Wyo. (Centennial)	"	W. B. Owen
25	1950	Banff, Alta.	"	C. W. Farstad
26	1951	Itasca State Park, Minn.	"	A. C. Hodson
27	1952	Prince Albert, Alta.	"	A. P. Arnason
28	1953	Bozeman, Mont.	"	J. H. Pepper
29	1954	Kamloops, B. C.	"	J. D. Gregson
30	1955	Sylvan Lake, S. D.	"	G. B. Spawn
31	1956	Winnipeg, Man.	R. D. Bird	W. R. Allen
32	1957	Fargo, N. D.	"	J. A. Callenbach
33	1958	Saskatoon, Sask.	"	H. McDonald
34	1959	Jackson Hole, Wyo.	J. A. Callenbach	R. E. Pfadt
35	1960	Blairmore, Alta.	"	L. A. Jacobson

Meetings of Northwest Association of Horticulturists, Entomologists and Plant Pathologists

Meeting	*Year*	*Place*	*President*	*Secretary-Treasurer*
1	1921	Hood River, Ore.	E. R. Bennett	A. L. Lovett
2	1922	Yakima, Wash.	O. M. Morris	C. W. Hungerford
3	1923	Boise, Idaho	A. L. Lovett	C. C. Vincent
4	1924	Penticton, B. C.		
5	1925	Corvallis, Ore.	Presiding Officer	
6	1926	Tacoma, Wash.	H. P. Barss	H. D. Locklin
7	1927	Moscow, Idaho & Pullman, Wash.	C. C. Vincent	B. F. Dana (Absent) C. L. Vincent
8	1928	Vancouver, B. C.	E. J. Newcomer	F. E. Buck
9	1929	Bozeman, Mont.	C. W. Hungerford	F. M. Harrington
10	1930	Medford, Ore.	D. F. Fisher	C. E. Schuster
11	1931	Wenatchee, Wash.	F. C. Reimer	Anthony Spuler
12	1932	Lewiston, Idaho	L. Childs	J. M. Raeder
13	1933	Hood River, Ore.	F. M. Harrington	O. T. McWhorter
14	1934	Yakima, Wash.	R. L. Webster	J. M. Raeder
15	1935	Kelowna, B. C.	R. C. Palmer	"
16	1936	Bozeman, Mont.	H. E. Morris	"
17	1937	Corvallis, Ore.	O. T. McWhorter	"
18	1938	Moscow, Idaho	H. R. McLarty	"
19	1939	Wenatchee, Wash.	F. L. Overley	"
20	1940	Seattle, Wash.	D. C. Mote	"
21	1941	Hood River, Ore.	E. Smith	"
	1942–45	War Period—no meetings		
22	1946	Chase, B. C.	E. P. Venables	J. C. Snyder
23	1947	Yakima, Wash.	E. C. Blodgett	"
24	1948	Farragut, Idaho	L. Verner	"
25	1949	Corvallis, Ore.	J. R. Keinholtz	"
26	1950	Polson, Montana	C. R. Hunt	"
27	1951	Victoria, B. C.	A. F. Barss	"
28	1952	Puyallup, Wash.	C. L. Vincent	"
29	1953	Caldwell, Idaho	J. M. Raeder	W. R. Foster
30	1954	Corvallis, Ore.	J. H. Milbrath	"
31	1955	Penticton, B. C.	R. P. Murry	"
32	1956	Mt. Vernon, Wash.	P. C. Crandall	"
33	1957	Polson, Montana	M. M. Afanasiy	C. G. Woodbridge
34	1958	Moscow, Idaho	D. F. Franklin	"
35	1959	Corvallis, Ore.	S. C. Jones	"
36	1960	Vancouver, B. C.	W. Foster	"

Meetings of Rocky Mountain Conference of Entomologists

Meeting	*Year*	*Place*	*Chairman*	*Secretary*
1	1923	Pingree Park, Colo.	C. P. Gillette	G. M. List
2	1924	"	"	"
3	1925	"	"	"
4	1926	"	"	"
5	1927	"	"	"
6	1928	No meeting		
7	1929	Pingree Park, Colo.	"	"
8	1930	"	"	"
9	1931	"	"	"
10	1932	"	"	"
11	1933	"	"	"
12	1934	"	"	"
13	1935	"	"	"

Rocky Mountain Conference (Continued)

Meeting	*Year*	*Place*	*Chairman*	*Secretary*
14	1936	Centennial, Wyo.	?	?
15	1937	No meeting		
16	1938	Centennial, Wyo.	C. P. Gillette	G. M. List
17	1939	Ward, Colo.	"	"
18	1940	Cameron Pass Colo.	R. H. Painter	"
19	1941	"	H. C. Severin	"
20	1942–46	No meetings		
21	1947	Cameron Pass	C. R. Jones	"
22	1948	"	L. P. Daniels	"
23	1949	"	E. Hixson	"
24	1950	"	L. P. Daniels	"
25	1951	"	D. E. Howell	"
26	1952	"	T. R. Robb	"
27	1953	Pingree Park, Colo.	W. W. Franklin	"
28	1954	Camp Gould, Colo.	D. M. Delong	"
29	1955	"	P. A. Ray	"
30	1956	Cameron Pass, Colo.	C. Sooter	"
31	1957	Centennial, Wyo.	W. D. Frank	G. Mickle
32	1958	Cameron Pass, Colo.	R. C. Dobson	W. D. Fronk
33	1959	"	H. Knutson	"
34	1960	"	P. Marvin	"

Meetings of Cumberland-Shenandoah Valley Fruit Conference

Meeting	*Year*	*Place*	*Chairman*	*Secretary*
1	1925[1]	Winchester, Va.	H. G. Knight	A. W. Drinkard
2	1925[2]	Martinsburg, W. Va.	G. R. Lyman	E. C. Sherwood
3	1926	Hagerstown, Md.	H. G. Knight	W. J. Schoene
4	1927	Chambersburg, Pa.	N. J. Giddings	"
5	1928	Washington, D. C.	"	A. W. Drinkard
6	1929	Winchester, Va.	F. D. Fromme	W. J. Schoene
7	1930	Hagerstown, Md.	E. C. Auchter	G. E. Yerkes
8	1931	Winchester, Va.	E. N. Cory	A. Lee Schrader
9	1932	"	R. D. Anthony	F. N. Fagan
10	1933	"	W. S. Hough	A. B. Groves
11	1934	Washington, D. C.	J. R. Magness	J. W. Roberts
12	1935	College Park, Md.	J. H. Beaumont	A. Lee Schrader
13	1936	Martinsburg, W. Va.	E. C. Sherwood	E. Gould
14	1937	Winchester, Va.	A. H. Teske	A. B. Groves
15	1938	Waynesboro, Pa.	R. N. Fagan	R. S. Kirby
16	1939	College Park, Md.	F. P. Cullinan	M. C. Goldsworthy
17	1940	Martinsburg, W. Va.	E. C. Gould	C. F. Taylor
18	1941	Winchester, Va.	A. H. Teske	S. A. Wingard
19	1942	Martinsburg, W. Va.	H. N. Worthley	H. W. Thurston
	(Insect Committee only. Worthley in military service. Thurston acted)			
20	1943	Hagerstown, Md.	R. D. Anthony	H. M. Steiner
21	1944	Martinsburg, W. Va.	L. G. Leach	R. H. Sudds
22	1945	Winchester, Va.	W. S. Hough	S. A. Wingard
23	1946	Frederick, Md.	A. F. Vierheller	E. A. Walker
24	1947	Waynesboro, Pa.	G. M. Darrow	A. L. Havis
25	1948	Martinsburg, W. Va.	J. G. Leach	H. W. Prettyman
26	1949	Winchester, Va.,	A. H. Teske	C. H. Hill
27	1950	Frederick, Md.	G. S. Langford	L. E. Scott
28	1951	"	J. O. Pepper	F. N. Hewetson
29	1952	"	A. L. Havis	H. Baker
30	1953	Martinsburg, W. Va.	R. Marsh	J. G. Leach
31	1954	Winchester, Va.	A. H. Teske	W. P. Judkins
32	1955	Hagerstown, Md.	L. E. Scott	T. L. Bissell
33	1956	"	R. S. Kirby	R. E. Larson
34	1957	"	B. A. Porter	W. L. Smith, Jr.
35	1958	"	R. Marsh	R. E. Adams
36	1959	"	S. A. Wingard	H. A. Rollins, Jr.
37	1960	"	A. H. Thompson	W. R. Krestensen

Meetings of Western Cooperative Spray Project

(Formerly Western Cooperative Oil Spray Project)

Meeting	*Year*	*Place*	*Chairman*	*Secretary*
1	1926	Tacoma, Wash.	(Organization)	
		Spokane, Wash.	J. R. Parker	

[1] July.
[2] December.

Western Cooperative Spray (Continued)

Meeting	*Year*	*Place*	*Chairman*	*Secretary*
2	1927	Moscow, Idaho	E. J. Newcomer	A. Spuler
		Spokane, Wash.	"	"
3	1928	"	"	"
4	1929	"	"	"
5	1930	"	"	"
6	1931	"	"	"
7	1932	Seattle, Wash.	"	F. L. Overley
8	1933	Portland, Ore.	"	"
9	1934	Hood River, Ore.	"	"
10	1936	Walla Walla, Wash.	"	"
11	1937	"	"	"
12	1938	Spokane, Wash.	"	"
13	1939	Walla Walla, Wash.	"	"
14	1940	"	"	L. G. Smith (pro tem)
15	1941	Seattle, Wash.	"	F. L. Overley
16	1942	Portland, Ore.	"	"
17	1943	Yakima, Wash.	"	"
18	1944	Portland, Ore.	"	"
19	1945	Walla Walla, Wash.	"	"
20	1946	Portland, Ore.	L. Childs (pro tem)	"
21	1947	"	E. J. Newcomer	"
22	1948	"	"	"
23	1949	"	"	"
24	1950	"	"	"
25	1951	"	F. L. Overley (pro tem)	K. C. Walker
26	1952	"	E. J. Newcomer	L. G. Gentner (pro tem)
27	1953	"	H. S. Telford	"
28	1954	"	"	V. W. Olney
29	1955	"	L. G. Genter	H. R. Wolfe
30	1956	"	R. Sprague	H. Andison
31	1957	"	L. C. Terrier	A. S. Horn
32	1958	"	G. F. Knowlton	"
33	1959	"	H. Madsen	"
34	1960	"	F. Ellerton	"

Meetings of Pacific Northwest Cooperative Pea Weevil Control Project

Meeting	*Year*	*Place*	*President*	*Secretary-Treasurer*
1	1937	Walla Walla, Wash.	C. Wakeland	
2	1938	Spokane, Wash.	Don C. Mote	
3	1939	Portland, Ore.	J. C. Chamberlin	
4	1940	Walla Walla, Wash.	R. D. Eichmann	
			T. H. Brindley	
5	1941		R. D. Eichmann	J. R. Douglass
6	1942	(1st Annual Northwest Truck Crop Insect Control Conference)		
		Walla Walla, Wash.	R. D. Eichmann	"
7	1943	Portland, Ore.	R. D. Eichmann	T. A. Brindley
8	1944	Pullman, Wash.	W. E. Shull	"
		Moscow, Idaho		
9	1945	(Northwest Vegetable Insect Conference)		
		Walla Walla, Wash.	H. B. Mills	"
10	1946	Portland, Ore.	D. C. Mote	"
11	1947	"	R. H. Webster	"
12	1948	"	J. C. Chamberlin	D. E. Brannon
13	1949	"	G. Knowlton	"
14	1950	"	T. Brindley	"
15	1951	"	H. C. Manis	"
16	1952	"	H. S. Telford	"
17	1953	(Pacific Northwest Vegetable Insect Conference)		
		Portland, Ore.	C. L. Neilson	"
18	1954	"	J. C. Chamberlin	"
19	1955	"	H. H. Crowell	"
20	1956	"	J. Walz	"
21	1957	"	W. C. Cook	H. E. Dorst
22	1958	"	D. Finlayson	"
23	1959	"	R. Every	"
24	1960	"	C. F. Doucette	"

Meetings of New York and New England Fruit Spray Specialists Meetings

Meeting	*Year*	*Place*	*Chairmen*
1	1939	New Haven, Conn.	P. Garman
2	1940	New Haven, Conn.	"
3	1941	Amherst, Mass	"
4	1942	Waltham, Mass.	W. D. Whitcomb
5	1943	Poughkeepsie, N. Y.	R. W. Dean
6	1944	Kingston, R. I.	E. P. Christopher
7	1945	New Haven, Conn.	J. G. Horsfall
8	1946	Amherst, Mass.	W. H. Thies
9	1947	Poughkeepsie, N. Y.	R. W. Dean, D. H. Palmiter
10	1948	Burlington, Vermont	C. H. Blasberg
11	1949	Durham, N. H.	E. J. Rasmussen
12	1950	Waltham, Mass.	W. D. Whitcomb, O. C. Boyd
13	1951	Springfield, Mass.	T. W. Kerr
14	1952	Springfield, Mass.	A. I. Bourne
15	1953	Poughkeepsie, N. Y.	D. H. Palmiter, R. W. Dean, J. A. Adams
16	1954	Durham, N. H.	A. Rich, E. J. Rasmussen
17	1955	Storrs, Conn.	W. D. Tunis
18	1956	Burlington, Vermont	C. L. Calahan, G. B. McCollum
19	1957	Amherst, Mass.	E. H. Wheeler, C. J. Gilgut
20	1958	New Haven, Conn.	P. M. Miller
21	1959	Hunting Camp, Maine	

Meetings of Tobacco Insect Council

Meeting	*Year*	*Place*	*Chairman*	*Secretary*
1	1937	Florence, S. C.		S. Marcovitch
2	1938	Oxford, N. C.	W. D. Reed	"
3	1939	Greenville, Tenn.	"	"
4	1940	Blacksburg, Va.	"	"
		Tobacco Insect Conference (name changed)		
5	1941	Oxford, N. C.	W. D. Reed	"
6	1942–45	No meetings		
7	1946	Tifton, Ga.	J. O. Rowell	G. W. Underhill
8	1947	Florence, S. C.	J. O. Rowell	C. F. Stahl
9	1948	Raleigh, N. C.	C. F. Stahl	H. H. Jewett
10	1949	Danville, Va.	H. H. Jewett	W. W. Stanley
11	1950	Gainesville, Fla.	D. J. Caffrey	F. S. Chamberlin
12	1951	Clemson, S. C.	W. C. Nettles	N. Allen
		At Clemson, it was decided to hold two meetings in three years		
13	1953 (June)	Raleigh, N. C.	Norman Allen	G. D. Jones
14	1955 (Jan.)	Richmond, Va.	G. D. Jones	J. N. Tenhet
15	1956 (Aug.)	London, Ont.	J. N. Tenhet	J. P. Vizant
16	1958 (Jan.)	Athens, Ga.	J. P. Vinzant	C. B. Dominick
17	1959 (June)	Raleigh, N. C.	C. B. Dominick	L. C. Kuitert
18	1961 (Jan.)	Clemson, S. C.	L. C. Kuitert	N. Allen

NEW PUBLICATIONS

SOUND PRODUCTION AND SOUND RECEPTION BY INSECTS: A BIBLIOGRAPHY, by Mable Frings and Hubert Frings. The Pennsylvania State University Press, University Park, Pennsylvania. 1960. 5¾ x 9 inches, 108 pp. Clothbound, $4.00.

This bibliography, which the authors consider relatively complete through 1957, should be very useful to those studying the behavior of insects, particularly in trying to understand insect conversations. A taxonomic index and a subject index are included.

1960 AMERICAN TOMATO YEARBOOK. John W. Carncross, Editor; C. Stedman Macfarland, Jr., Publisher, 8 Elm Street, Westfield, N. J. 44 pp., price $2.00. This book contains much interesting and vital information of use to everyone connected with the tomato industry in any way. A complete volume 1951–1960, is available at $14.00.

1960 AMERICAN POTATO YEARBOOK. C. Stedman Macfarland, Jr., Editor and Publisher, 8 Elm Street, Westfield, N. J. 80 pp., price $2.00. Contains a wealth of statistical and other information covering all phases of the potato industry. A 10-page onion supplement is included. A complete volume, 1950–1960 is available at $14.00.

THE PESTICIDE SITUATION 1959–1960. A report of the Agricultual Chemicals staff, Harold H. Shepard, in charge. Commodity Stabalization Service, U. S. Department of Agriculture, Washington 25, D. C.

BOOK REVIEWS

MEDICAL ARTHROPODOLOGY LABORATORY GUIDE, by Dorald M. Allred. Burgess Publishing Company, Minneapolis, Minn. 1960, 84 pp. Spiral bound, $3.00.

This laboratory guide is designed for use in a college course along with "standard textbooks in medical entomology", a course preceded by basic work in entomology or invertebrate zoology. There are 14 laboratory exercises which deal with the classification of medically important arthropods, and with cockroaches, cone-nosed bugs, miscellaneous biting bugs, lice, house flies, blood-sucking flies, myiasis, fleas, mites, ticks, miscellaneous arthropods implicated with diseases, and poisonous and urticarial arthropods. Featured in most of the exercises are charts to be filled in with pertinent information about the life cycle, habits, habitats and control of the various pests. The completed charts would appear to be just the thing that succeeding generations of students might copy from used laboratory guides, but even if this happens, they will learn a little during the process.

The manual is illustrated with pictorial keys and other diagrams prepared by the Communicable Disease Center, Public Health Service, U.S.D.H.E.W. The student is required to make relatively few drawings. He is required to identify representatives of the various groups of arthropods using the pictorial keys. Field trips are emphasized and are called for with nearly all exercises. An extended trip of several days duration is part of the planned work. At many institutions, unlike Brigham Young University where the author teaches, these field trips would not be practical or even possible.

Besides the laboratory exercises each student is assigned 10 theoretical problems from a list of 29. Written and oral reports are required. The references to the literature are well-chosen and reasonably up-to-date.

WILLIAM E. BICKLEY
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A FINE UNDERTAKING. Under this title, the following book review appeared recently in the Russian periodical *Protection of Plants from Pests and Diseases*[1], *5*(4):59, 1960.

This book[2] recently issued and quickly sold out in the bookstores of Moscow and Leningrad, is a translation of the ANNUAL REVIEW OF ENTOMOLOGY published in 1956 in the United States of America.

At present, when hundreds of entomological papers are being published monthly in various inaccessible journals, it is difficult for the entomologist to keep up with the literature on any specialized topic. Doing so in one's special field is possible only through reading reviews of the current literature. The periodic publication by the Publishing-House-of-Foreign-Literature of translations of original papers on the chemical means of plant protection have indeed been helpful in various phases of experimental work in this field, but few of them have provided the entomologist with a broad view. In the present publication, however, each article can be of interest to specialists in diverse scientific fields. The relation between molecular structure and toxicity (Martin's review of the "Chemistry of Insecticides") preoccupies not only the entomotoxicologist but also the synthesist of chemicals and the specialist in chemical physics. The article by Frisch and Lindauer, "The Language and Orientation of the Honey Bee" is so fascinating that it can be read with pleasure not only by the apiculturist or the specialist in the physiology of behavior, but also by the non-biologist (as Romain Rolland called his favorite writer Faber). Not only entomologists, but biologists in other fields—geneticists, virologists, bio-chemists, physiologists, ecologists, evolutionists, and even agronomists, foresters, beekeepers, epidemiologists, veterinarians, mechanical engineers concerned with plant protection, will find this book highly interesting. The presence of an authors' index helps in the search for information.

Most of the reviews are dedicated to the control of harmful insects, chiefly by chemicals, and cover almost all of the points. That is all the more valuable, because similar works published in the Russian language during the past quarter century are very few. Besides the above-mentioned article by Martin, the volume contains reviews on the mode of action of insecticides (Kearns), arthropod resistance to poisons (Hoskins and Gordon), the action of poisonous chemicals on the dynamics of arthropod populations (Ripper), apparatus for the application of insecticides (Brank),[3] and the persistance of insecticide residues in plants (Gunther and Blinn). Some problems of plant protection are dealt with in Lilly's summary on "Soil Insects and their Control," Parkin's "Storage Pests," Greyel's[4] "Ecology of Forest Insects," Smith and Braier's[5] "Insect Transmission of Virus Diseases to Plants," and Camp's "Contemporary Quarantine Problems."[6]

Unfortunately, it took too long between the time the authors had compiled the literature for their reviews (middle of 1955) and the publication of the Russian edition. That compelled the editor, while annotating each article, to supplement it with the latest data of interest. In the preface, as far as possible, was corrected another important shortcoming of the Review—the meager coverage of the authors of Russian papers.

This book can be recommended to a broad circle of readers.

V. N. STARK
Doctor in Agricultural Science
P. V. SAZONOV
Candidate in Agricultural Science

E.S.A. member T. M. DOBROVSKY *kindly furnished the foregoing translation and the footnote comments. This is a most interesting linguistic turn of the wheel and is indicative of the universal problem of communication.*

The Editor.

LABORATORY MANUAL FOR GENERAL INVERTEBRATE ZOOLOGY, by Tyler A. Woolley. Burgess Publishing Company, Minneapolis, Minn., 1960. 8½ x 11 inches, 229 pp. Price: $3.50.

This laboratory manual is a straightforward approach to an introductory survey of the invertebrate animal groups. It is accurate, the descriptions and working directions are clear, and the choice of types for dissection and study is good. The emphasis is on morphology and phylogeny. It is one of the best manuals of this type now available. It warrants consideration for adoption by any instructor who teaches an introductory course in invertebrate zoology at the lower division level.

G. W. WHARTON
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[1] English translation of the Russian title, *Zashchita Rasteniy ot Vrediteley i Bolezney.*

[2] *Contemporary Problems in Entomology*, Volume 1, a translation from the English, edited by B.I. Rookavishnikov; Publishing-House-for-Foreign-Literature, 1959, 422 pages. (The price is not given).

[3] For "Brann".

[4] For "Graham's".

[5] Braier's is for "Brierley's".

[6] The wording of the titles of the chapters given in this translation of the book review is the nearest approximation of the Russian version of the titles.

THE TRUE BOOK OF INSECTS, by Illa Podendorf, illustrated by Chauncey Maltman. Childrens Press, Chicago, 1954. 7½ x 8½, 47 pp. Price $2.00.

Although this book was published several years ago, I believe it will be new to most entomologists. It is for small children at the age when all the world is new and wondrous. The author, a science teacher, has made an excellent presentation considering the difficulty of reducing such a varied field to a few simple elements. The topics include what insects are; how they grow and what some of the different kinds do. Over half the space is given to drawings, black-and-white and color. These are quite well done—clear with reasonably good detail and accuracy. The accompanying text is in large clear type, and according to the title page, 98 percent of the words are from the "combined word list for primary reading." The entomologist will find a few technical errors and discrepancies which could have been avoided by closer technical editing, particularly in some of the common names, e. g. June bug for June beetle.

This reviewer has long been concerned that most children grow up in complete ignorance of the insects, the largest class in the animal kingdom. Even worse, so many acquire an unreasoned fear of insects from equally ignorant parents who admonish against "awful, nasty bugs." It has been quite gratifying, therefore, to find so instructive a book for this very impressionable age group. I suggest it for schools and parents, and for entomologists who like to combine children and insects.

J. S. YUILL
Forest Insect Research
U. S. Forest Service

FAMILIAR INSECTS OF AMERICA. By Will Barker. Illustrations by Carl Burger. 24 cm. Harper & Brothers, New York, 1960. xviii + 236 pp., 4 col. pls., numerous sketches. Price: $4.95.

Nowadays, book stores offer a large number of attractive new books, dealing with a wide variety of subjects. Entomology is better represented among the books designed for general readers than formerly was the case. In addition to handbooks, and short books for children, quite readable books, semipopular but primarily informative works, are appearing with increasing frequency. Such a one is this book by Will Barker, who formerly was employed by the U. S. Fish and Wildlife Service, since has written two earlier popular books on animals, and contributed to *Natural History* and other magazines.

This book is not designed for the professional entomologist, but for members of the public with an attraction to Nature and an urge to know more of the common but oftentimes neglected living things. In fact, the pleasant style of the author and the attractive illustrations no doubt will appeal to many readers who previously have regarded insects as mere pests. To spread an understanding of insects and to help entomology come of age as a profession, there is need for such books in this period of growing population and increasing leisure time.

Ten chapters deal with familiar orders of insects, and each contains some general information about the order covered, followed by interesting aspects of various common species included in the order. Several remaining minor orders are discussed in an 11th chapter, and there is a glossary of terms, references for additional reading, and an index. Most of the illustrations appear to be very useful, as well as adding greatly to the attractiveness of the book.

The author has gone to many sources for the facts reported, and as a whole a true picture is presented. Only a few errors have been noted, such as associating *Aedes triseriatus* (a common tree-hole mosquito of the eastern U. S.) with jungle yellow fever. More reviewing of the manuscript by competent readers would probably have eliminated most of the few "slips" with names and facts. Like professional entomologists, who themselves sometimes have failed to invite sufficient reviewing before the publication of books, writers who offer their work to the general public have a strong responsibility to have manuscripts thoroughly reviewed. Will Barker is a good writer who does his homework well; he has not seized upon the sensational, hoping to make a salable product; this latest book is a good introduction to insects and a very creditable piece of nature reporting.

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BEES OF THE EASTERN UNITED STATES, VOLUME I, by Theodore B. Mitchell, North Carolina State College, 7 x 10 inches, cloth bound, 538 pp., 134 figs. 16 tables. Tech. Bull. 141, N. C. Agric. Expt. Sta. 1960. Price $10.00 plus 25¢ mailing costs.

This magnificent piece of work is the culmination of some 38 years of collecting and taxonomic research by Dr. Mitchell. The present volume treats the more primitive families Colletidae, Andrenidae, Halictidae and Melittidae; the remaining families (Megachilidae, Anthophoridae, Xylocopidae and Apidae) will be handled in Volume II. More than 450 valid species and subspecies are recognized in the four families treated in Volume I. The area covered by the manual is the United States east of the Mississippi River, but it will be equally useful for eastern Canada.

The book is well printed in readable 2-column format. It is much more copiously illustrated than is indicated by the 134 figures in the citation above; each text figure consists of one to 30 or more separate illustrations. Many of the species are illustrated by drawings of the male genitalia and retracted abdominal sterna, and facial views of one or both sexes.

An extended introduction includes useful sections on techniques of collecting and preservation, ecology, and morphology; the latter section is illustrated by line drawings of the various parts used in identification. The introductory part is concluded with an artificial key to the eight families of bees recognized by Mitchell. At the family level Mitchell accepts the classification proposed in Michener's work on the North American bees (1944), except that he raises the Anthophorinae and Xylocopinae to family rank; these changes probably will be accepted by many hymenopterists who feel that these two groups merit equal status with such families as the Colletidae, Andrenidae and Halictidae.

The families are treated in systematic order. A brief characterization of the family is followed by keys to the genera; the latter are also treated in systematic order. Again, Mitchell's views on generic classification are quite similar to Michener's except that he raises to generic rank the halictine bees that Michener treated as subgenera of *Lasioglossum;* in my opinion this is premature and may not be tenable when this very complex assemblage is reviewed from a world standpoint. The treatment under each generic heading consists of bibliographic citations of the generic and subgeneric names proposed for each genus with genotypes followed by a brief generic characterization. Separate keys are provided for the identification of the species in each genus.

The treatment at the specific level is laudably complete: Synonymy and important references to biology and taxonomy are given under the specific heading followed by a complete specific description, a summary statement of distribution, and an alphabetical listing of the generic names of flowers visited. The 16 tables indicate the distribution of each species by states. A number of new species are described, particularly in *Andrena* and *Dialictus;* detailed label data are given for all specimens in the type series of the new species. Where numerous flower records are given, it would have been helpful if some summary statement could have been added, such as "visits mostly Compositae" followed by the detailed records.

There are very few misspellings of specific names, and a few new names based on geographical names are not